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ABSTRACT

This study examined the classroom experiences of teachers and pupils in 12 primary schools in Scotland. In each school, researchers spent a week with one class, observing the teachers and six target pupils selected to represent the ability range within the class. Through interviews with teachers and pupils, the researchers aimed to identify the amount of time both groups spent on various types of activity, and to explore the reasons for particular patterns. Among the findings are the following: (1) the time spent on various curriculum areas diverged considerably from the amount suggested in the 5-14 curriculum guidelines; (2) there was high variation in classroom organization; (3) pupils spent about two-thirds of their time engaged on tasks; (4) target pupils spent about 40 percent of their time in some form of teacher-student interaction and 40 percent in interaction with other pupils; (5) the teacher behaviors most associated with pupil engagement, collaborative learning activities and one-to-one interaction with the teacher, were rarely observed; (6) teachers spent 82 percent of their time in teaching and related activities; and (7) teachers used a variety of teaching strategies, with different strategies predominating with different age groups. Issues that emerged as warranting further investigation included the balance of the curriculum, students' independent work, the implications of a heavy workload, and teachers' and pupils' views on changes in the ways pupils learn as they progress through primary school. (Contains 45 references.) (KB)

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Teachers' and Pupils' Days in the Primary Classroom

Joanna McPake
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The Scottish Council for Research in Education

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Contents

		Page
Acknowledgements		**vi**
Executive Summary		**vii**
1 Introduction		**1**
1.1	Background	1
1.2	Previous work involving classroom observation	3
1.3	Research methods	8
1.4	Procedures	11
1.5	Data analysis	12
1.6	The form of this report	12
2 Pupils' Days in the Classroom		**14**
2.1	Introduction	14
2.2	Time spent on activities in various subject areas	14
2.3	Pupils' time in different types of classroom organisation	17
2.4	Time spent by pupils in different kinds of activity	19
2.5	Time spent by pupils in various forms of interaction with the teacher and with each other	22
2.6	Percentage of time the teacher is engaged in different activities when in interaction with the target pupils	24
2.7	Summary	25
2.8	Implications	26
3 Supporting Learning		**27**
3.1	Observing learning	27
3.2	Classroom interaction and time on task	27
3.3	Optimising conditions for learning	32
3.4	Summary	34
3.5	Implications	34
4 The Teacher's Day		**35**
4.1	Teachers' work in the classroom	35
4.2	The overall picture	35
4.3	Activities related to teaching	36
4.4	Non-curricular activities	38
4.5	Summary	40
4.6	Implications	41
5 Teaching Approaches		**42**
5.1	How do teachers teach?	42
5.2	Teaching approaches	43
5.3	A question of style?	47
5.4	Summary	49
5.5	Implications	49

6 Emerging Issues **51**
6.1 Review of the report 51
6.2 Links to earlier research 51
6.3 Further research 53
6.4 In conclusion 54

References **55-57**

Appendices
A–1 Pupil Observation Schedule 57
A–2 Operational definitions of timed pupil observation categories and definitions 58
A–3 Procedures for Pupil Observers 60
A–4 Teachers' Observation Schedule 62
A–5 Teacher Observation Categories and Definitions 63
A–6 Notes on Teacher Observation 64
A–7 Video Recording 65
B–1 Extended Teacher Interview 66
B–2 Daily interview with target pupil and teacher, based on classroom photographs 67
C–1 Profile of Schools 68
C–2 Analyses of Variance of Pupil Data 69
D–1 Percentage of time spent on various subject areas by target pupils in each school 70
D–2 Percentage of time spent by target pupils in various forms of classroom organisation in each school 71
D–3 Percentage of time spent in various kinds of activity by target pupils in each school 72
D–4 Percentage of time spent by target pupils in various kinds of interaction in each school 73
D–5 Percentage of time spent by the teacher in different activities when in interaction with target pupils in P1 classes 74

Figures
2.1 Time allocations proposed in the 5–14 Guidelines 15
2.2 Percentage of time spent on various subject areas averaged across the twelve classes 15
2.3 Percentage of time spent on various subject areas averaged across classes by P level 16
2.4 Proportion of time spent by target pupils at each P level and across all twelve schools on various forms of classroom activity 19
2.5 Percentage of time spent in whole class on various curriculum areas across the four classes for each P level and overall 19
3.1 Percentage of time spent by target pupils engaged on task when in various forms of interaction averaged across schools for each P level and over all twelve schools 28
4.1 Overall average allocations of teachers' time to teaching and managing 36
4.2 Time spent on teaching and managing activities in the three year groups 36
5.1 Overall averages for teaching approaches across twelve schools and three year groups 43

Tables

1.1	School sample	11
2.1	Percentage of time spent in various kinds of activity, overall and by P level	20
2.2	Percentage of time spent 'on task' by pupils in different ability bands, overall, by P level and by gender	21
2.3	Percentage of 'on task' time spent on different activities overall and by P level	21
2.4	Percentage of time spent by pupils in various forms of interaction overall and for each P level	23
2.5	Percentage of time spent in different activities by the teacher when in interaction with the target pupils	25

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Most of all we would like to thank the twelve teachers of the schools we visited in the course of this research. We recognise that our request to spend a week in their classrooms made considerable demands on them and appreciate their willingness to take part. We learnt much and were reminded of the pleasures of primary teaching as well as the challenges.

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Executive Summary

This report discusses findings from research carried out by a team from the Scottish Council for Research in Education (SCRE) into the classroom experiences of teachers and pupils in primary schools. The project was funded by SOEID and as part of the SOEID/ SCRE contract and took place from September 1996 to August 1998. The research was based on detailed classroom observation in twelve schools. Four Primary 1, four Primary 4 and four Primary 7 classes participated in the study. In each school, researchers spent a week with one class, observing the class teacher, and six 'target' pupils, selected to represent the ability range within the class. The researchers aimed to identify the amounts of time which pupils and teachers spent on various types of activity and to explore the reasons for particular patterns or choices through interviews with teachers and pupils. The intention was to establish 'baseline' information relating to classroom activities and to identify features meriting more detailed investigation, with a view to improving the quality of teaching and learning. This summary describes the principal findings.

1. Pupils' days

1.1 Time spent on curriculum areas

The time spent on various curriculum areas by target pupils in the twelve classes we observed diverged considerably from the amount suggested in the 5-14 curriculum guidelines. In discussion, teachers argued that no one week is 'typical' and that there are a number of reasons why imbalances may found at any one point. In their view, these imbalances are corrected over the course of the term, the year, or the seven years which pupils spend at primary school.

Language: Overall, target pupils spent a third of their time on language activities. This suggests that teachers allocated almost all of the 'flexible' element provided in the 5-14 curriculum guidelines to language (for which the recommended proportion of the curriculum is 15%). Almost all of this time was spent on English.

Maths: Target pupils in P1 spent less time than is recommended on maths (11% rather than 15%). Target pupils in P4 and P7 spent more time on this subject (21% in each case).

Environmental studies: Target pupils in all year groups spent markedly less time (on average, 11%) on environmental studies than is recommended (25%).

Expressive arts: Target pupils in all year groups spent more time (on average, 23%) on expressive arts than is recommended (15%).

Religious and moral/ personal and social education: On average, target pupils spent half the recommended time on religious and moral and personal and social education (5% rather than 10%).

1.2 Time spent in different forms of classroom organisation

Seating arrangements in the different classrooms we visited were flexible. Desks and chairs were usually arranged as large 'tables' around which the children sat while working.

Sometimes teachers would call pupils out to work in small groups (usually ability groups) with them. Sometimes they would teach the whole class, either by addressing pupils where they sat or by calling all pupils out to sit around the teacher on the floor. In none of the schools we visited were desks arranged in rows. However, seating arrangements did not necessarily reflect working arrangements: while pupils were frequently observed to be sitting in mixed-ability groups, they often worked on tasks as individuals.

Mixed-ability groups: Target pupils in P1 spent most of their time in mixed-ability groups.

Ability groups: Target pupils in P4 and P7 spent approximately a third of their time in ability groups.

Whole-class teaching: Whole-class teaching was used more frequently with P1 than with P4 or P7.

Variation in the forms of classroom organisation encountered in the twelve classes we visited was high.

1.3 Time spent on different types of activity

The principal activities target pupils were observed to be engaged in over the course of the day were defined as 'engaged on task', 'managing task', 'assessment', 'distracted', 'waiting', and 'filling in'. Overall, the pupils spent about two thirds of their time 'engaged on task' and a further 10% on 'managing the task'.

1.4 Time spent in interaction with the teacher

Target pupils spent almost the same amount of time in some form of interaction with the teacher as they did working on their own or interacting with other pupils (about 40% of the time in each case). A little over half (56%) of target pupil-teacher interaction involved teaching. For about a third of the time, such interaction related to task management. Very little interaction between teachers and pupils which related to assessment was recorded.

Most of the time that the pupils spent in interaction with the teacher was in a whole-class teaching situation. It was much less common for them to be observed in interaction with the teacher while working in a group, or in one-to-one interaction with the teacher. However, it was notable that target boys described by the teacher as 'above average' were observed in one-to-one interaction with the teacher three times as often as 'above average' target girls.

1.5 Time spent on task

Teachers supported pupils' learning in various ways in the classroom. Those most closely associated with engagement on task included collaborative learning activities and one-to-one interactions between target pupils and the teacher. However, these forms of support were rarely observed.

Situations in which pupils were least likely to be on task included working independently of the teacher while interacting socially with other pupils, and working in small groups with the teacher. The latter situation tended to include a substantial task management element (and therefore pupils' behaviour was not classified as 'on task'). While teachers' routines are designed to maximise the amount of time available for teaching, and to support a systematic approach to learning, there is a danger that some routines promote a narrow repertoire of learning strategies and lead to tedium (and ultimately distraction) for the pupils.

2. Teachers' days

2.1 Time spent on classroom activities

The teacher's time in the classroom is divided between teaching and activities related to teaching (such as managing learning, recording and assessment), and activities not directly related to the delivery of the curriculum (administration, pastoral work, classroom control). On average, teachers spent over four fifths (82%) of their time on teaching and related activities. However, the recording and assessment of pupils' work was rarely observed. 'Non-curricular' activities took up 18% of teachers' time within the classroom, but teachers clearly spent a considerable amount of time out of class hours on assessment, administration and possibly on pastoral matters.

2.2 Time spent on teaching

Teachers used a range of teaching strategies: these included instruction, demonstration, facilitating learning, observation and eliciting pupil performance. Instruction was the most commonly used strategy.

Different strategies predominated with different year groups: eliciting pupil performance was most common with P1, instruction with P4 and facilitating learning with P7. These findings suggest that teachers' choice of strategy may be related to teachers' perception that pupils' approaches to learning become more sophisticated with age.

However, variation among teachers in relation to choice of teaching strategy was high and suggests that teachers' teaching 'style' is a product of a range of factors including teachers' personalities and experience and the particular circumstances of the school and of the group of pupils each teaches as well as more generally relevant matters such as the age group or the curriculum area taught.

3. Emerging issues

Four issues emerge as warranting further investigation. These are:

- the balance of the curriculum, viewed from teachers' and pupils' perspectives, and how this is achieved over time
- the nature of the work which pupils are expected to do independently of the teacher and the contexts in which they are expected to work independently
- the implications of a heavy workload (in and beyond the classroom) for the ways in which teachers organise their classroom work and the impact this has on pupils' learning
- teachers' (and pupils') views on changes in the ways pupils learn as they progress through the primary school and the implications these have for teaching strategies adopted.

1 Introduction: Classroom Observation Studies

This report describes experiences of pupils and teachers in primary classrooms as observed in research that took place from September 1996-August 1998 and was funded by the Scottish Office Education and Industry Department and SCRE contract.

1.1 Background

What goes on in primary school classrooms is not easy to access nor, necessarily, to understand. It is easily misrepresented, leading to myths and assumptions which can neither be denied nor confirmed because of lack of relevant and reliable data. It is, however, important to know what does go on if there is to be a firm basis for any action that might be taken to improve the effectiveness of teaching and learning. Furthermore, if change is anticipated it is important to establish a base-line of practice before it takes place and to evaluate the impact of specific actions taken.

However it is not only in the context of innovation that information is needed about the practices and interactions in the classroom. At any time it is necessary to monitor classroom processes, just as it is necessary to monitor their outcomes as is done through schools' own assessment and the national monitoring by the Assessment of Achievement Programme (AAP). The inspection of schools by HMI is part of the monitoring process, covering a wide range of aspects of the school and feeding back formative information and summative judgements to the school and to the community. The self-evaluation by schools, using procedures such as described in How Good Is Our School? (SOEID 1996) is a further form of monitoring, using the same criteria as used by HMI and thus enabling schools to judge their own performance against the same standards that HMI use to judge them.

These external and internal forms of evaluation differ from the study reported here in two important ways. First, they cover all aspects of the schools' operation: the curriculum, attainment, learning and teaching, support for pupils, ethos, resources and management, leadership and quality assurance (SOEID, 1996). Clearly they cannot report on all of these aspects in equal detail and depth. Second, by their nature and purpose, they are judgmental. In the present study, by contrast, we aimed to describe and understand practice, not to judge it. The present study was also confined to events taking place in the classroom. Given the existing and recent work already carried out on the implementation of the 5-14 guidelines in primary classrooms (Malcolm and Schlapp, 1997; Harlen, 1996; Malcolm and Byrne, 1996) the study was focused primarily on teaching and learning rather than on matters relating to the curriculum, except in so far as the curriculum provides the context for teaching and learning. Certain indicators from How Good Is Our School? were used in guiding decisions about data to be collected, ensuring that this would include aspects of events of agreed significance and interest to both schools and other stakeholders in education.

Our aims, therefore, were:

- to establish 'baseline' data relating to teachers' and pupils' activities in the classroom which serve to indicate how current concerns (for example about the balance of the curriculum or about the relationship of teaching approaches to pupil experiences) are met through classroom practice; and which may be used as a way of measuring changes introduced by new initiatives designed to improve the quality of future teaching and learning.
- to explore teachers' and pupils' views on their classroom experiences.
- to identify classroom phenomena of particular interest which might benefit from more detailed analysis of the data, or from additional research.

With these in mind the following research questions were identified:

The experiences of pupils and teachers in the primary classroom

1. What proportion of time do pupils spend on different activities, in various physical groupings and in various kinds of interaction with the teacher?
2. What proportion of time do teachers spend on different activities in the classroom and in different kinds of interaction with pupils?
3. What are the observable features of the classroom organisation and management that support effective teaching and learning?
4. To what extent are teachers and pupils involved in assessing pupils' work and how is this information used in determining the next steps in learning?

The use of the SOEID Performance Indicators for The Quality of Learning and Teaching

5. What are the observed activities of teachers and pupils and how are these described in terms of the Performance Indicators?
6. How do teachers think about their work in ways which can be related to themes 3.1-3.4 of the Performance Indicators?

Teachers' and pupils' perceptions of influences on their work

7. What influences teachers' decisions about the activities of individual pupils and how to promote their learning?
8. How do teachers' perceptions of what is happening, and what should happen, in the classroom compare with what is observed?
9. How do pupils' perceptions of their activities compare with teachers' intentions and with observations?
10. What are teachers' views of what impedes and facilitates their effectiveness in the classroom?

In attempting to describe the events in the primary classroom to answer these questions, the study focused equally on the experiences of teachers and pupils. Observation necessarily had an important part to play in gathering data. Much recent research in Scottish schools has had to rely on teachers' own accounts of their practice (eg Harlen, 1995; Malcolm, 1995; Simpson *et al*, 1995). Teachers' own accounts necessarily reflect their perceptions of what they do, but it is well known that such perceptions are dependent on personal interpretations both of what is intended and of what happens in practice.

Observation studies, whilst not making claims to the truth of what goes on in classrooms, nevertheless add an important dimension to describing and understanding these events. They can provide direct evidence of the coping strategies teachers adopt to

reconcile the often conflicting demands of ideology, official expectations and practical constraints. They often reveal unintended aspects of practice. For example Pollard *et al* (1994), in the PACE project, found through classroom observations that the introduction of the National Curriculum was accompanied by significant shifts in the balance of whole-class, group and individual teaching and an erosion of direct teaching time. The project also identified areas of tension between the view of knowledge in official documents and the espoused views of primary teachers. Among the findings of Plewis and Veltman (1996) from observations of a number of infant pupils in London schools, was that white pupils spent more time on mathematics than black pupils and covered more of the curriculum. This was reflected in the attainment of the pupils.

However, it was also important to complement observation by conducting interviews with the teachers and pupils so as to tap the thinking behind actions and the perceptions of each party of the others' actions. The methods used therefore had to involve extended observation and interview. In deciding the form the data collection might most usefully take, the project team studied previous research and evaluation work involving classroom observation. This is now briefly summarised before describing the methods used in the study.

1.2 Previous work involving classroom observation

Serious use of observation in classroom research dates from the 1970s in the UK but was preceded by work in the US which led to the first collection of observation schedules under the title Mirrors for Behaviour (Simon and Boyer, 1970). A collection of British observation schedules was published later (Galton, 1978). Perhaps earlier use in the UK was inhibited by the objections to the approach in the US represented by the Flanders Interaction Analysis Category (FIAC) system, with its ten categories and three second time-sampling. This drew criticism for focusing on a narrow range of behaviours, selected because they could be reliably recorded rather than because of a basis in some theoretical view of teaching and learning style. Consequently, of the considerable amount of research into primary teaching in the 1970s in the UK, much was conducted mainly by questionnaire (eg Bennett, 1976, Bassey, 1978).

At the same time, however, work was being conducted which broke through the objections to systematic observation and went a good way to meeting the specific criticisms. In England this work was centred in Leicester and in Scotland at the Scottish Council for Research in Education (SCRE). The Observational Research and Classroom Learning Evaluation (ORACLE) project at Leicester was preceded by work in science education at the secondary level which established, through systematic observation, different styles of teaching in science (Eggleston *et al*, 1976) and by work in the primary school by Boydell (1974). In Scotland, the Scottish Education Department, as it then was, funded SCRE to conduct a project on Teaching Strategies in the Primary School which developed the SCOTS schedule (Powell, 1985).

Observation was also an important element in the evaluation of the large scale attempt to improve primary education in Leeds, from 1985 to 1989. The evaluation of this programme, led by Alexander, became known as the Primary Needs Independent Evaluation Project (PRINDEP). Soon after this, the introduction of the National Curriculum in England and Wales, in 1989, was the spur to several projects which monitored the impact of the new curriculum and assessment arrangements in primary classrooms. The ESRC-funded Primary Assessment, Curriculum and Experience (PACE) project was one of these and became a longitudinal study of considerable significance. Further ESRC-

funded work focused on the assessment of activities of teachers and pupils were: the National Assessment in Primary Schools (NAPS) project (McCallum *et al*, 1993), which monitored the implementation of the national assessment in the first two years of primary school; the Teacher Assessment at Key Stage 1 project (TASK) (Torrance and Pryor, 1995); and the Changes in Classroom Experiences project (Plewis and Veltman, 1996).

In Scotland, classroom observation was used as one of the methods of data collection in the evaluation in secondary schools of TVEI (Black *et al*, 1991), in the evaluation of the Managed Effective Learning programme (Devine *et al*, 1998) and in the study of how school processes influence pupil progress (Duffield *et al*, 1996). In pre-secondary education, classroom observation was used in the evaluation of foreign languages in the primary school (Low *et al*, 1993), in the evaluation of the quality of pre-school provision (Powney *et al*, 1995; McCail, 1991), and the study of the experiences of Japanese children in UK primary schools (McPake and Powney, 1998).

Those projects most closely related in aims and methods to the present project, and which, in particular, used systematic classroom observation are now briefly reviewed. Reference is made to the findings and interpretations in some of these projects in discussion of the findings in later chapters of this report.

Teaching strategies in the primary school project

The Teaching Strategies in the Primary School, funded by the SED from 1973, initially had the aim of comparing the effects of 'progressive' and 'traditional' methods in the primary school, but abandoned this in favour of 'attempting to record, and to seek to understand, the complex patterns of activity that we saw in the primary classroom' (Powell, 1985, p 7). An instrument, the System for the Classroom Observation of Teaching Strategies (SCOTS) was developed for observing classrooms. This was used by trained observers in 30 schools in 1974/5 before it was revised and used in observing 128 teachers in 30 schools in 1977/8. The schedule comprised 43 items for most of which five optional descriptions were provided. A judgement as to which description for each of these items matched the observed actions of the teacher was made by the observer five times in the day. The items ranged over the extent of differentiation, the teacher's questioning, feedback to pupils, etc. Judgements on some items required discussion with the teacher. Pupils in the study were tested before and after the observations using tests devised by the researchers and assessing arithmetic, application to work and attitudes to school and learning.

A cluster analysis was used to find patterns in teachers' actions which could be described as 'styles'. Seventeen clusters were identified, each describing different combinations of judgements on the 43 items. These were not easily identified as 'progressive' or 'traditional' but rather in terms of teachers' strengths and weaknesses. When the change in test scores between pupils' pre- and post-test and the post-test means were calculated for teachers in each cluster, the variation within any cluster was found to be greater than the variation from one cluster to another. This was true for all the measures and led the researchers to conclude that no relationship had been found between the style of teaching and the outcomes tested.

The very different structure of the SCOTS and the observation schedules used in ORACLE, PRINDEP and in the present study, makes it difficult to compare findings directly, since the information provided by the first was more holistic than in each of the others. However, Powell was able to comment on whole-class teaching as compared with group teaching, confirming the findings of the ORACLE project on the need to maximise teacher-pupil interactions by combining whole-class teaching and group teaching methods.

He also observed that weaknesses such as poor feedback to pupils, pupils queuing for corrections to their work, time-wasting transitions from one task to another and lack of pupil training in independent working, were found in both whole-class and group teaching (Powell, 1985, p 162).

PRINDEP

The Primary Needs Independent Evaluation Project (PRINDEP) was the evaluation of the Leeds Local Education Authority Primary Needs Programme (PNP), established in 1985. The aims of the PNP were wide-ranging and included changes to the curriculum and teaching methods and pro-active development of links with parents and the community. There was a particular focus on provision for pupils with learning difficulties. The LEA put almost £14 million extra into primary education between 1985 and 1989, targeting the schools in greatest need of help. The funding was spent on additional staff, increased capitation, refurbishment of buildings and in-service support. The scope of the evaluation had to match the breadth of the programme and examined six specific areas: children's needs; the curriculum; teaching strategies and classroom practice, including collaborative teaching; links between home, school and community; school management; professional support and development (Alexander, 1997).

The PRINDEP used a range of data-collection methods including interview, structured classroom observation, semi-structured observation of INSET courses, documentary analysis and analysis of reading scores of pupils over a six-year period. The structured classroom observations of pupils yielded findings relating to the time pupils spent on various areas of the curriculum, on different generic activities (reading, writing, etc) and in various other forms of activity (working, waiting, etc). Observations of the teacher indicated the proportion of time spent in different types of interaction with the pupils. Other types of information and analysis added a mass of inter-related information from which important conclusions and recommendations were drawn concerning the PNP project (see Alexander, 1992, 1995; Alexander, Willcocks and Kinder, 1989).

The specific interest in PRINDEP in the present context was particularly in the methods found to be most useful in revealing insights into the primary classroom. The research studied the effects of the LEA's intervention at three 'levels' of increasing detail, varying from a single classroom visit to extended systematic classroom observation of both pupils and teacher. The findings are important from the point of view of research methodology as well as for their addition to knowledge about primary practice. They demonstrate the value of combining qualitative and quantitative data from direct observation and of recording teacher-pupil interactions; as the level of detail of the evidence became finer, so the level of comment on classroom practice became sharper, more specific and more important. Thus from general comments on the difficulties inherent in the job of teaching, based on single classroom visits and teacher interviews, the analysis moved to providing what turned out to be devastating revelations from the detailed accounts of actual teaching, combined with quantitative data about the time spent by pupils on different activities. For example, in pupils' experience the content of the curriculum was dominated by reading and writing, with relatively little time spent on talking and collaborative work; teachers' interactions with pupils were marked by 'pseudo-questions', closed questions, uncritical acceptance of pupils' ideas, teachers talking and pupils listening (Alexander, 1995).

There was also interest in comparing findings from the three levels of study and in the hypotheses advanced by Alexander to account for the findings. For example, PRINDEP found that pupils in the classes observed spent about 32% of their time on English, 20%

on mathematics, 15% on science and environmental studies and about 6% on art. On average they spent 59% on task, 11% on routine managing tasks, 8% waiting, 21% distracted and 1% in other ways. Teachers' interactions with pupils were, on average, 37% concerned with the task, 20% monitoring, 27% routine managing, 10% concerned with discipline and 6% on other activities. Alexander suggested that patterns of organisation in the classrooms made excessive demands on the teachers, preventing them from giving constructive feedback to pupils and meaning that pupils often spent time waiting for the teachers' attention.

ORACLE

The Observational Research and Classroom Learning Evaluation (ORACLE) project was similar to the Scottish Teaching Strategies in the Primary School project in having as one of its aims the intention to relate the processes of the classroom to the 'product' in terms of pupils' learning. Like the Scottish project, too, it identified styles of teaching by clustering information about teachers' inter-actions. It differed however in recognising the need to focus on pupils as well as teachers, acknowledging that pupils are active participants in learning, not passive receivers.

Thus there were two observation schedules devised, or adapted, by the ORACLE team, one for observing pupils and one for observing teachers. They were used, in turn, by the same observer. Both schedules required information to be recorded every 25 seconds. The observer changed focus from one of eight target pupils to another, observing each for ten intervals of 25 seconds and then moved to the teacher for 45 intervals. The sequence of observing pupils was changed on subsequent rounds. Other information, about the grouping of the pupils, was also noted. Observations were carried out in 58 classes in 19 primary schools. The pupils were also given various tests, including the Richmond Tests of Basic Skills and a questionnaire on 'What I do in school' (see Galton and Simon, 1980, for details).

The pupil observation schedule had three main sections for recording information about pupil-adult interaction, pupil-pupil interaction and pupil activity. The teacher observation schedule recorded three types of teacher interaction: questions, statements and silent interaction (eg marking, waiting, reading, showing). Cluster analysis of the findings in the teacher record produced four main styles of teaching which were named by the researchers as 'individual monitors', 'class enquirers', 'group instructors' and 'style changers'. These names signal the main features of each style, which were, briefly:

Individual monitors: these teachers spent a high proportion of the time on individualised, one-to-one interaction with pupils; they spent very little time in group or class teaching; they spent much time marking; their questioning was mainly factual and their teaching largely didactic.

Class enquirers: these teachers spent the highest proportion of all the styles on class teaching but combined this with individualised teaching; they used questioning to a high degree and emphasised problem-solving and ideas.

Group instructors: these teachers spent more time interacting with groups; gave a high level of feedback; their teaching was largely didactic.

Style changers: these teachers combined individual, group and class interaction, changing their teaching style when they changed the pattern of organisation; three sub-groups of this style were dubbed 'infrequent changers', 'rotating changers', and 'habitual changers'.

The 'products' (ie the pupil achievement scores) were compared for pupils of teachers in each of these style groups. It was found that in basic skills, the infrequent changers and the class enquirers were the most successful styles, with the rotating changers being the least successful. For study skills, it was the habitual changers and the class enquirers who emerged as most successful, with the rotating changers once more as least successful. Galton and Simon comment:

> Of some significance may be the fact that all three groups of successful teachers had more task interactions than the typical teacher in the sample...it is interesting to see that the two most successful styles were interacting with pupils for nearly 90% of the time in which observations were carried out. (p196)

Overall, the teachers spent 56% of their time interacting with individual pupils, 8% interacting with groups of pupils, 15% in whole-class interaction and 22% with no pupil interaction. This meant that, whilst the teacher was interacting with pupils for 78% of the time, the average pupil was interacting with the teacher for only 16% of time, most of this being as part of the whole class and only 2% as an individual.

In a follow-up study, conducted in 1996, the ORACLE observations of teachers and pupils and tests of pupils were repeated in 38 schools, most of whom had taken part in the 1976 study. In terms of how teachers spent their time, the results showed a reduction in interaction with individual pupils (to 45% of time) and an increase in interaction with groups (to 15%) and a doubling of whole-class teaching. Non-interaction was down by a half to 11%. Galton commented that 'teachers are working much harder because many tasks once incorporated into the teaching day are now carried out after school' (Times Educational Supplement, July 3, 1998).

The PACE project

The Primary Assessment, Curriculum and Experience (PACE) project was aimed specifically at monitoring the impact of the introduction of the National Curriculum and assessment on primary schools, teachers and pupils in England and Wales. From 1990 to 1996, it followed a sample of pupils who were in the first year group to experience the National Curriculum, as they passed from the start of infant school to the end of primary. There were two samples of schools, the main one of 48 schools, from whom information was collected by questionnaire and interview from headteachers and infants' teachers, and a sub-sample of nine schools where additional information was collected by classroom observation, pupil interview, field notes and more in-depth interview with the class teacher.

Classroom observations were conducted each year, following the initial cohort of pupils through the infant and junior years either in the same school or from school to school where infant and junior were separate. To conduct the observations the schools were visited for one week, with systematic observation and pupil interviews taking place in the middle three days and qualitative (ie general) observation of pupils, and interviews with teachers, taking place on the other two days. The schedule for pupil observation required a record to be made of the type of pupil activity, the interaction with others and the type of teacher activity if the teacher was directly interacting with the observed pupil. Records were made every ten seconds for six minutes, followed by four minutes for contextual notes. Quite extended pupil interviews were conducted with the child who had been observed as soon after observation as possible. Questions included the children's views about themselves, the social atmosphere of the class, the teacher and the child's relationship with the teacher and views on being assessed by the teacher.

The project gave particular attention to assessment and the administration of Standard Assessment Tasks and Tests (SATs), observing the first administration of these in the nine schools, which was to classes in the year above the class being followed. A considerable variation in the conduct of the National Tests was found between the first and second year of their administration. Both teachers and pupils were more aware of the SATs as being separate from normal practice in 1991 than was the case in 1992, when some teachers attempted to make the tests seem as much a part of normal work as possible. The consequences were two-fold: on the one hand, many pupils did see the tests as helping their learning, but on the other hand there were considerable variations from class to class in administration.

Many of the PACE findings were based on the views of teachers and headteachers of the changes that the National Curriculum had brought about. For example, more headteachers perceived a reduction in time spent on English, mathematics, art and music than perceived an increase of time for these subjects. Conversely many more perceived an increase in time on science, technology, history and geography (separate subjects in the National Curriculum) than the reverse.

Findings from the systematic observation of pupils in 1990 and 1991 indicated that the time spent by pupils in whole-class settings dropped slightly from 40% to 36%. Although it is interesting to compare this with the 31% from the ORACLE follow-up study, it must be remembered that these PACE figures apply to infant pupils whilst ORACLE was concerned with junior pupils. In the PACE study pupils interacted with the teacher in group settings for about 11% of the time and as individuals for about 3%. This gave a total of about 43% of time in some form of interaction with the teacher. Figures for the overall types of interaction of the teacher with pupils were not available since the teacher was only observed when in interaction with the target pupils.

PACE reported time spent by pupils on task engagement, task management, assessment, waiting, reading to the teacher and when distracted. Correlation among these activities and teaching context showed that high levels of task engagement were associated with high levels of class interaction (ie whole-class teaching). High levels of individual work were associated with high levels of task management and, to a lesser extent, distraction. Whilst not assuming that on task time is necessarily a surrogate for learning, it is clearly the most likely form of pupil activity to lead to learning. This finding therefore confirms the importance of the proportion of time in which pupils have some interaction with the teacher, most of which has to be in a whole-class setting.

1.3 Research methods

The main means of collecting data in the project reported here was the use of classroom observation supplemented by interviews with teachers and pupils.

Observation

The observation methods used in the research just reviewed all involved observers being present in the classrooms to make a record of the action but not to take part in it. An alternative would have been to use a video camera, tape recorder or other recording device either instead of, or in addition to, the observer. These are forms of non-participant observation, and contrast with participant observation, where the observer is present and takes part in the action. Participant observation is necessary in situations where it is impossible for a camera or observer to be unobtrusive; for example, when observing a group which meets outside the structure of the classroom or school. Such groups can often only be observed by those in the group and the 'observer' has to be a member and a

participant. In other cases, where the observer and any recording device can operate with minimum interference in the action, this is the preferred approach. In our study there was no alternative to this since what we wanted to find out concerned the experiences of teachers and pupils as 'naturally' as possible.

The use of video recording alone was not considered a realistic course of action, not only on account of the difficulty of obtaining good sound quality and vision covering all of the classroom without intrusive equipment, but because it leaves untouched the problem of summarising the data, as needed to answer many of the research questions. A further factor was the reluctance of many teachers to have a camera in the classroom, whilst not objecting to 'live' observers. However the advantage of having some examples of classroom events which can be replayed and used in illustration of summary data was recognised. Thus, in cases where the teacher agreed it was decided to video-record a sample of the observed action, using an unobtrusive, fixed camera.

Using the experience of previous studies (Galton *et al*, 1980; Cavendish *et al*, 1990; Croll, 1996; McPake and Powney, 1998), the decision was made to use two observers in each classroom, one focusing on the teacher and the other on a small number of 'target' pupils. The main reasons were the following:

- Whilst the amount of information collected in the same time from the classroom is clearly doubled, experience shows that the ability to combine the views of the researchers provides more than twice the benefit.
- Important aspects of both pupils' and teachers' activities are lost in frequent switches of attention from one to the other if one observer attempts to track both.
- The soundness of interpretation of events in the classroom is substantially increased by the ability of observers to discuss their views even though their detailed observations have different foci at any one time.

In deciding the form of the schedule that the observers would use, consideration was given to the degree of structure that was appropriate. The more unstructured the record, the less what is recorded has to be predetermined, leaving decisions to be made on the spot about what it is relevant to record. More structured observation requires some form of schedule.

Schedules which look at actions over time can be divided into two main types according to whether they are based on event-sampling or time-sampling. In event-sampling, the schedule has a continuous time-line, marked off in seconds or longer intervals depending on the particular situation being observed. The observer marks the beginning and end of an event of interest along the time-line, thus providing the basis for calculating its duration. This method is used where fairly exact timings are required but where the events do not change too rapidly or overlap to a great extent. In our case, however, the interest was in a number of events that may occur in rapid succession or simultaneously, thus time-sampling was more appropriate.

The time interval in a time-sampling system is determined by the time needed to make a decision about how to categorise what is going on. It can be as little as five seconds if the record required is, for example, a simple check against who is talking, or as long as one or two minutes if the decision required is, for example, about how involved a child is in his or her activity, in which case a reasonable time for observing the child's behaviour is needed. Since an observed activity is recorded only once in a time interval, however long it may last within the time interval, the sum across several intervals may exaggerate the duration of the activity in this time. Thus the length of the interval is important and should be as short as can allow for a reliable record to be made, in order to reduce the error due

to this effect in summation. After trials of various time intervals, using video recordings of classroom events, it was decided that intervals of one minute were the most suitable, for both teacher and pupil observations.

The form of the pupil observation schedule was decided after considering the experience of instruments used, for example, by SCRE in the research into the provision for pre-fives (Powney *et al*, 1995), TVEI (Black *et al*, 1991) and the experiences of Japanese children in schools in the UK (McPake and Powney, 1998), and by others: in the ORACLE project (Galton, Simon and Croll, 1980), the STAR project (Cavendish *et al*, 1990), the PACE project (Pollard *et al*, 1994; Croll, 1986) the Changes in Classroom Experiences project (Plewis and Veltman, 1996) and by Walker and Adelman (1975), Bennett and Kell (1989), Tizard *et al* (1988), and Mortimore *et al* (1988). In addition to observation which was focused on individual pupils and teachers, we also considered an instrument designed to give a more general picture of the classroom and which implicitly identified aspects of quality in children's experiences. The Pre-Five Environment Quality Rating Scale (McCail, 1991) itself draws on a wide range of research into early childhood education to identify the features which provide a suitable environment for pre-school pupils. The method could be adapted for other age groups where the aim is to arrive at an overall judgement or to evaluate specific aspects, having similarities with the approach of How Good Is Our School (SOEID, 1996).

Items in the schedule were decided after taking note of the existing ones developed in the work of others, particularly the ORACLE and PACE projects, and were substantially modified and honed through successive trials with video recorded material, before being tried out 'live' in a local primary school. During this development the operational definitions of the categories were gradually refined so that observers could follow agreed guidelines as to what was included in each category. The schedules and category definitions are given in Appendices A1 and A2.

In addition to the structured observations, unstructured, 'general' observations were recorded between sequences of observing the target pupils. Detailed descriptive accounts of the actions of one child were made for periods of up to 30 minutes at a time, thus adding a dimension of depth to the information about the target pupils' experiences in the classroom.

The teacher observation schedule was rather more problematic. Teachers tend to do several things at once and move from one focus to another in rapid succession, as for example, in hearing a child read whilst at the same time 'keeping an eye' on other pupils and giving quick instructions to others in order to keep the range of activities in the classroom going. A list of categories was not a convenient way of recording multiple aspects of teachers' activity. Instead, a condensed version of a list was created, which identified major categories of activity: managing task, teaching, recording, pastoral work, controlling, administration, class organisation and unrelated tasks. These were broken into sub-categories, as listed in Appendices A4 and A5, and, in addition, for the 'teaching' category, the form of interaction was also recorded. These observations were recorded every minute and supplementary notes made, as described in Appendix A6.

Use of the teacher schedule was synchronised with the systematic observation of pupils, so that at a later date it would be possible to cross-check on pupil and teacher activities at the same time. When general observations were being carried out on target pupils, the teacher observer also made a record of general observations of the teacher. In both cases these accounts provided the qualitative information that could later be used to illustrate the quantitative data.

As mentioned, video recording was carried out, where agreeable to the teacher, throughout one whole day. Notes on the purpose of, and procedures for, this recording are given in Appendix A8.

Interviews with teacher and pupils

To help in understanding the interactions in the classroom and their implications for pupils' learning, interviews were conducted with teachers and pupils. As a focus for interviewing pupils, each morning during the week of observation, several events involving a target pupil were photographed using a digital camera. These images were loaded into a portable computer during the lunch hour and a suitable image was selected for discussion with the pupil at a convenient time during the afternoon. The same image was shown to the teacher after school. The questions asked of the teacher and pupil were brief and complementary to each other and are given in Appendix A3. In addition, an extended interview with the teacher was conducted towards the end of the week. The guidelines for this are in Appendix A7.

1.4 Procedures

Duration of observations

The research required two researchers to be in each classroom throughout one whole week. This was considered the minimum time needed to sample the range of events and activities taking place. A week is a natural planning unit for schools although it was recognised that there was considerable variation from one week to another.

Selection of schools

The number of classes proposed for the study was twelve, a compromise between the in-depth study needed to collect valid information about what goes on in classrooms and the need to explore the extent of variation from one class to another (cf Alexander, Willcocks and Kinder, 1989). Although there was no intention to regard the classes as a representative sample of classes or schools, it was important to include a range of pupil age levels, school sizes and school locations. Thus classes were sought and obtained to fill each cell in the following grid. Profiles of the schools and teachers of the classes observed are given in Appendix B.

Table 1.1: School sample

Pupil level	Composite	Rural	Large rural/ suburban	Urban
P1	School 1	School 2	School 3	School 4
P4	School 5	School 6	School 7	School 8
P7	School 9	School 10	School 11	School 12

School visits and additional information

Schools were identified via the appropriate education authority adviser and an initial approach made by telephone to arrange a date for a visit to explain the project in more detail and what participation would involve. In most cases the preliminary visit to the school was made by the two researchers who would conduct the observations and interviews. An initial visit to the classroom and a meeting with the teacher was part of this visit. The selection of pupils for observation was discussed with the teacher, and although the researchers made the final decision, no attempt being made to conceal the identity of the target pupils from the teacher. However, the teacher did not know when a particular child was being observed.

The preliminary visit was also an opportunity to extend an offer for the researchers to include in their data collection, if possible, some information of particular interest to the school or teacher. Only a few schools took up this offer for additional information. For example, one school had a particular interest in having a video of the PE class for staff development purposes and this was provided.

Selection of pupils

Six target pupils were selected from each class, except in the case of one composite class which had only two P1 pupils. Thus in total 68 pupils were observed. They were selected by asking the teacher to list pupils in three ability bands - below average, average and above average. A boy and a girl were chosen from each of these bands. Comments from the teacher, for example, about the attendance record of the children, were also used in making the selection.

Timing

Data collection in the twelve schools, involving two researchers in each school for a full week, was completed between February 1997 and April 1998. The procedures followed in conducting the observations and interviews are given in Appendices A and B. Each week was planned in advance so that periods of systematic and general observation were rotated to occur at different times on successive days.

1.5 Data analysis

The main factors examined in the quantitative analysis of the systematic observations were: school, pupil gender, pupil ability band and pupil age-group (P level). Initial descriptive statistics were produced and studied as a guide to applying the appropriate analyses of variance using SPSS.

The analysis of the large amount of qualitative data gathered by observation and interview was focused by the research questions and by the emerging themes from the quantitative data. In order to keep this report to a manageable size, the qualitative data are used here mainly to illuminate the findings from the systematic observations of pupils and teachers.

1.6 The form of this report

The following four chapters present some of the evidence from the twelve schools, describing the pupils' and teachers' days in the classroom and discussing some implications of the findings. It should be emphasised that what is reported here represents the first phase of analysis of a rich and complex data set. We have chosen, at this stage, to focus on the quantitative data gathered via our observation schedules. These data form a framework within which more detailed analysis of specific aspects of pupils' and teachers' classroom experiences can be set.

Chapters 2 and 3 of this report focus on aspects of the pupils' days. Chapter 2 reports how pupils spent their days in terms of the areas of the curriculum, the activities in which they were engaged, the interactions which they experienced and how their classrooms were organised. It examines differences in these aspects, where they existed, in relation to pupil age-group, gender and ability. Chapter 3 looks in more detail at relationships between variables in the pupils' experience. In particular it looks at how time on task is associated with different forms of class organisation and interactions.

Chapters 4 and 5 present data from observations of, and interviews with, the teacher. Chapter 4 focuses on the proportion of time spent by teachers on teaching compared with

other activities, such as managing, recording, pastoral care, control and organisation. Chapter 5 looks in more detail at the sub-categories within these major types of activity, particularly at those identified as different aspects of teaching: instructing, demonstrating, facilitating, observing and eliciting pupil performance.

Finally Chapter 6 brings together the findings and reviews them in relation to earlier research. It also draws together the implications that have so far been drawn by the research team from the study.

2 Pupils' Days in the Classroom

2.1 Introduction

This chapter presents findings from the structured observations of target pupils and addresses the research question: What proportion of time do pupils spend on different activities, in various physical groupings and in various kinds of interaction with the teacher?

The five main sections deal, in turn, with the subject areas in which target pupils were engaged when observed, the different types of classroom organisation in which they were working, the types of activities in which they were involved, the different forms of interaction with the teacher and with other pupils that they experienced and the kind of activities that the teacher was engaged in when in interaction with them. Findings in relation to these aspects of pupils' experience are reported at these levels: averages over all twelve classrooms involved in the study; separate averages across the classes at P1, P4 and P7; and summary data for individual schools. Differences according to the ability band of the pupils and their gender are mentioned where appropriate.

In all cases the data are based on the quantitative analysis of the systematic observations carried out as described in Chapter 1, using the schedule and operational definitions of categories given in Appendix A. The analyses of quantitative data presented in this chapter relate to the structured timed observations collected with the aid of the schedule and observational categories given in Appendix A. As can be seen in Appendix A-3, the timed structured observations were alternated with narrative and more qualitative accounts of pupil activities throughout the week. Each of these, the timed structured observations and the time narrative observation period, took up one third of the time pupils were normally in the classroom ie excluding break and lunch times. The remaining third of this classroom time comprised pauses between observation sessions and times when the pupils were not available for any one of a variety of reasons (eg out of the room, extended choir practices, suspension of normal classroom activities).

2.2 Time spent on activities in various subject areas

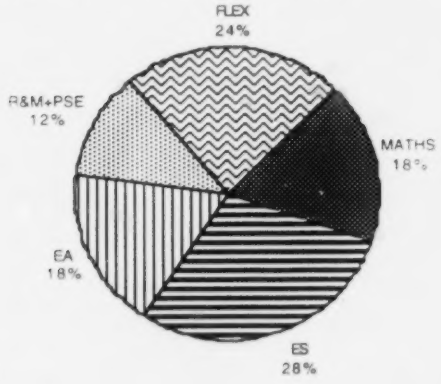
On walking into a working primary classroom it may be obvious that the children's activities relate to certain subject areas - if they are singing, painting or constructing, for example. In many cases, however, when they are sitting at tables, writing or reading, the subject focus is not so apparent. Even when it does seem to be clear on first sight, looking for a little longer time may reveal that, for example, the singing is part of language development or the painting primarily related to science or history. It takes sustained observation to see how a particular activity relates to subjects. Furthermore, in the active primary classroom, there is often work in several subject areas going on in different parts at the same time and pupils move from one to another as they complete the tasks assigned to them.

By focusing on our 'target' pupils as a sample of the class, we were able to observe closely and specifically so as to identify the subject matter of their activity at any time

and record this minute by minute. In these circumstances, there was only occasional difficulty in classifying the subject area and minimal observer variation. The following data are based on these observations of the six target pupils and the percentages given are proportions of observed time spent in various ways. The observations were made on each school day throughout one week and several of the schools were giving particular attention to one subject area during that week at the expense, in the short term, of some other area, although this usually applied to subjects other than language and mathematics.

As a basis for judging expectations of time spent in the various areas of the curriculum, it is useful to refer to the 5-14 guidelines, which suggest the proportions of time as given in Figure 2.1.

Figure 2.1: Time allocations proposed in the 5-14 Guidelines

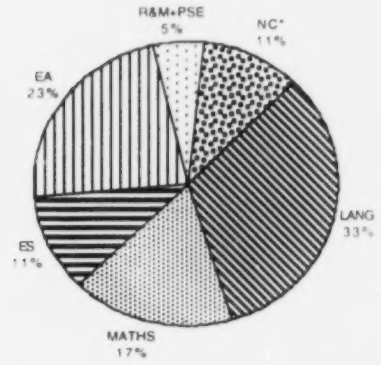


Key

LANG =	language
ES =	environmental studies
EA =	expressive arts
R&M+PSE =	religious and moral and personal and social education
FLEX =	flexible element

The allocations for curriculum areas add up to 80%, leaving a 20% flexible element for use according the teacher's discretion. This discretionary time is not generally identifiable in practice as a special time allocation: thus in Figure 2.2, which gives the overall pattern across all twelve schools, the 20% is included in various subjects. Since language emerges as the subject area which takes up most time, in addition to that allocated, it is a reasonable assumption that most teachers use the flexible element on this subject.

Figure 2.2: Percentage of time spent on various subject areas averaged across the twelve classes



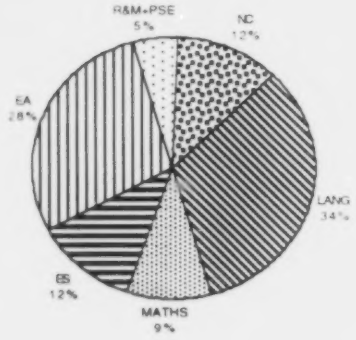
Key

LANG =	language
ES =	environmental studies
EA =	expressive arts
R&M+PSE =	religious and moral and personal and social education
NC =	non-curricular activities (routines such as taking the register, collecting money clearing up, etc)

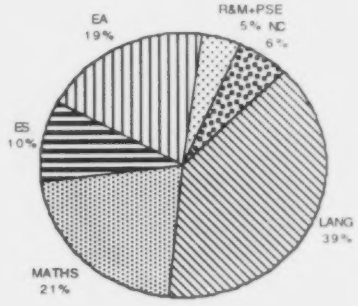
Figure 2.3 on the following page shows the proportions averaged across the four classes for each Primary level. At P1 and P4, language occupied more than twice the time recommended in the 5 14 guidelines and almost twice the recommended time at P7. It should be noted that this was time specifically relating to language development - reading, writing, speaking or listening - and does not include the use of language in activities with a predominantly different subject focus, (eg writing up work as part of a history project or discussing the outcomes of a science experiment). The time given to mathematics was below the 5-14 guidelines figure at P1 and above it at P4 and P7. Environmental Studies received consistently less that its recommended share of time. Furthermore, considering that most Environmental Studies time was given to science, this means that very little time indeed was spent on technology, social subjects, health education and information technology.

Figure 2.3: Percentage of time spent on various subject areas averaged across classes by P level

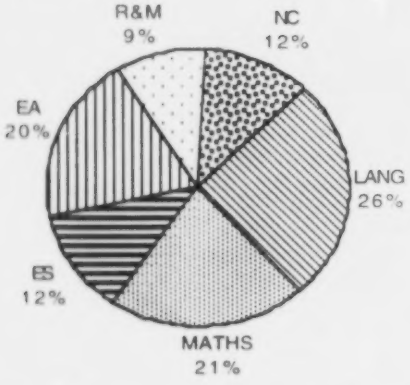
PRIMARY 1



PRIMARY 4



PRIMARY 7



Key

LANG =	language
ES =	environmental studies
EA =	expressive arts
R&M+PSE =	religious and moral and personal and social education
NC =	non-curricular activities (routines such as taking the register, collecting money, clearing up, etc.)

These findings are very similar in pattern to those found by Galton *et al* (1980) and in the PRINDEP work (Alexander, 1995) before the National Curriculum was implemented in the upper primary school in England. After that, it was noticeable that the time given to science was considerably increased (Campbell, 1993).

It was also the case that no school spent the recommended amount of time on Religious and Moral Education and that very little time was spent on learning a language other than English.

More detailed analysis of variation across schools (see Appendix D, Figure D.1) shows considerable differences in curriculum balance, probably reflecting the practice in some schools of giving attention to a particular subject area in concentrated blocks of time. Although we had hoped to make observations in a 'typical' week in each school, teachers told us that there is no such thing. For a variety of reasons, some classes were not following their 'normal' timetables when we visited. Around Christmas time, choir practice and Christmas play rehearsals took up time which would ordinarily have been spent on other activities. Similar events occur at other times of year. In one school, the week we had chosen to visit was 'Health Week', which involved a focus on different aspects of health education on a daily basis, as well as physical activities at the start of every day (stretching exercises and jogging round the school). As a result, the amount of time which this class spent on other curricular areas was reduced. Another school had been selected to take part in a national rugby tournament and more time than usual was spent on practising, playing for the selectors, preparing for the tournament and, finally, the tournament itself (which took place during the visit and resulted in the loss of the whole class for one of the observation days).

Such experiences are an important part of children's primary education. The fact that they disrupt the 'normal' curriculum is not an argument for limiting or suppressing them. Teachers argued that the imbalance which they represented in any particular week is redressed over the year. Others argued more generally that the curricular balance suggested in the 5-14 curriculum guidelines should be achieved over the seven years which children spend in primary school rather than in any one day, week or even year: for example, there may need to be a greater emphasis on language in the early years than in P6 and P7 because a good start in reading and writing is fundamental to everything else.

Thus it is not surprising to find that the ways in which teachers divided up their teaching time do not correlate very closely with those suggested in the 5-14 curriculum guidelines. Of course this balance may be achieved over longer periods of time, or at times other than when we visited, or in different classes or in different schools. However, inasmuch as our data relate to twelve classes representatively selected and visited at various times across the school year (we avoided the first and last weeks of each term), they do suggest marked imbalances at particular points.

Data collected from observations of teachers suggest that the proportion of time teachers spent on each curriculum area varied somewhat from the time spent by pupils. This appears to have been a consequence of the class organisation, whereby groups of pupils were set work by the teacher and carried out this work whilst the teacher gave attention to other groups. Some pupils often finished before the teacher had dealt with all the groups and turned to other on-going work or chose from a menu of activities. Alternatively, the teacher might set work in one curriculum area for most of the class and work on something else with an individual pupil or a small group. Thus it was not unusual for the teacher to be observed teaching one curriculum area while a target pupil was simultaneously observed at work on tasks relating to another curriculum area.

2.3 Pupils' time in different types of classroom organisation

In this section we look at the different forms of classroom organisation and, in particular, to the arrangements being experienced by the target pupils when observed. Most classrooms had the chairs and tables arranged so that children sat in groups around large 'tables' - usually individual desks pushed together to form a larger, shared surface. It was

rare for desks to be arranged individually in rows. However, there was considerable movement around the classroom in the course of the day. Pupils might move from table to table, depending on the activity on which they were engaged. They might also be called to work with the teacher in a particular part of the room, either as a part of a small group or as the whole class. Sometimes tables were moved, to fit new configurations. Sometimes, children moved to resource areas, either in the classroom or in 'open plan' areas attached to their classroom, in order to work with particular types of equipment. From time to time, the whole class, or a group, might move to another part of the school for particular activities, such as music or PE.

Four main types of classroom organisation were recorded in the observation schedules:

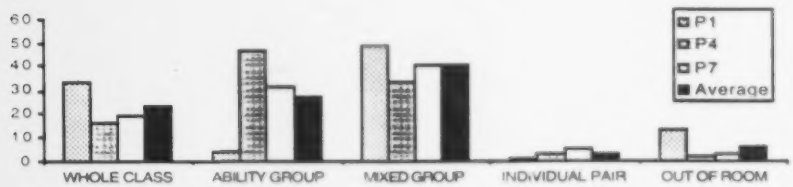
- **Whole-class**. All the children, including the target pupil under observation, were undertaking similar activity, at the same time, and usually being addressed by the teacher. In some cases, pupils all came together in one part of the room (e.g. on the floor in front of the teacher); in others, they remained where they were sitting but might have to turn their heads or twist around, in order to see the teacher.
- **Ability-group**. The target pupil was part of a group of children of similar ability in either language or maths (in most cases), formed at some time in the past by the teacher for the purposes of organising differentiated work. Ability-groups sometimes worked together with the teacher, and sometimes at a table together as a group, on tasks previously set for the group by the teacher.
- **Mixed-ability group**. The target pupil was in a group whose composition was unrelated to group members' abilities in language or maths. These groups may have been formed randomly by the teacher or have been designed deliberately to mix abilities; alternatively, the children themselves may have determined the composition of the groups, usually on the basis of friendships.
- **Individual pair**. The target pupil was working alone or with one other child, sometimes with the teacher and sometimes independently.

A fifth category included in this section was:

- **Out of the room**. The target pupil had left the room for a variety of reasons, including to work with specialised equipment in an open plan area near the classroom, to work with another teacher, either as an individual or as part of a group, to take part in cross-class activities such as choir practice or a play rehearsal, or sometimes to stay with the rest of the class when they moved elsewhere for gym, to visit the library, swimming classes, etc. Where possible the pupil observer followed the target pupil, but sometimes this was impracticable.

Figure 2.4 indicates the proportion of time spent by target pupils in each of these forms of classroom organisation. It is important to bear in mind the extent of flexibility in classroom organisation. In the course of the day, pupils might spend time in each of the four main forms of organisation (as well as time out of the room). However, the physical organisation of the classroom did not change as frequently and therefore did not always reflect the main mode of working: thus children might often be working on tasks set previously by the teacher for them as part of an ability group, yet sitting with a mixed-ability group.

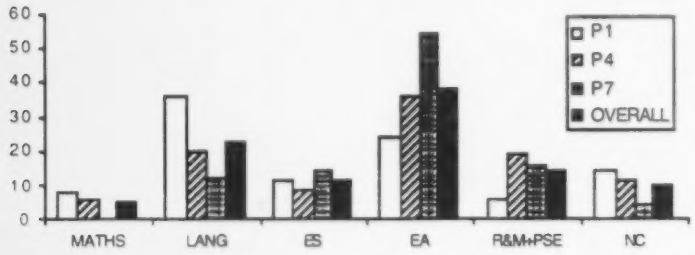
Figure 2.4: Proportion of time spent by target pupils at each P level and across all twelve schools on various forms of classroom activity



The main difference between the P levels is that ability grouping is an infrequent form of organisation for P1 pupils, but at P4 and P7 it is more common. However, patterns vary considerably from school to school. In one P4 class target pupils spent three quarters of the time in ability groups, whilst in another, this form of classroom organisation was hardly encountered at all.

The proportion of time target pupils spent as a whole-class was greater in P1 classes than in P4 and P7, and much of this time was devoted to language learning and teaching. Figure 2.5 shows how much whole-class teaching time was devoted to each curriculum area, at each P level.

Figure 2.5: Percentage of time spent in whole class on various curriculum areas across the four classes for each P level and overall



It appears from Figure 2.5 that in the observed classes very little mathematics work was undertaken in a whole-class setting, this amount diminishing to zero for the P7 classes. The time spent on expressive arts expanded as a proportion of whole-class teaching time from the P1 to the P7 classes. This is accounted for by subjects such as drama, music and art being given more formal treatment with the older than the younger children. For example, art activities were often undertaken with children in P1 classes during a time for 'choosing' their activity and so was rarely a whole-class activity in P1. Figure 2.5 also shows that a smaller proportion of whole-class time was spent on language for the older pupils, possibly in response to the widening ability range in classes of older pupils.

2.4 Time spent by pupils in different kinds of activity

We now turn to consider a different dimension of the children's experience, the question of what kinds of activity they were engaged in when in the classroom. This cuts across both the curriculum area and the classroom organisation. The observation schedule provided for several aspects of pupils' activity to be recorded.

- **Engaged on task (ET)**: The observed pupil was engaged on a task which served an educational purpose (other than assessment, which was separately recorded). One or more sub-categories were used to indicate the generic activities which the task involved: reading writing, talking, listening, drawing, using equipment/materials or using a computer.
- **Managing the task (MT)**: This category was used to indicate an activity associated with the task, such as collecting materials, sharpening pencils, filling in a routine record that the task had been completed, clearing up the particular material used, or listening to the teacher give instructions about task management.
- **Explicit assessment (As)**: The pupil was engaged upon a task specifically designed for assessment purposes, such as a teacher-made or an external test or task. It did not include questioning by the teacher as part of teaching.
- **Distracted (Dis)**: The pupil appeared not to be on task and seemed to be day-dreaming or chatting or 'messing about' without apparent aim.
- **Waiting (Wg)**: The pupil was waiting for a turn to do something or to talk to the teacher or to be given another activity. This was distinct from 'filling in' (below) in that the pupils were not observed to be doing anything other than waiting.
- **Filling in (FI)**: The pupil was engaged upon 'busy work', either of his or her own making or suggested by the teacher, but which appeared to have no purpose other than to fill in time. If given by the teacher, it was distinguished from 'on task' by absence of apparent educational purpose.
- **Out of the room**: The pupil was out of the classroom, for a range of purposes.

There were three other categories - 'interrupted by teacher', 'interrupted by pupil' and 'unapproved activity' which, in the event were so rarely used that they were disregarded in the analysis.

Most of these major categories were mutually exclusive (eg pupils could not simultaneously be recorded as being 'engaged on task' and 'distracted') However, when pupils were 'engaged on task', sub-categories were used to indicate the nature of the task, such as 'writing'.

Table 2.1 gives the percentages of time spent on each of the major kinds of activity, averaged for all twelve classes and for classes at each P level.

Table 2.1: Percentage of time spent in various kinds of activity, overall and by P level

Pupil activity	Overall	P1	P4	P7
Engaged on task	67	67	71	63
Managing task	10	11	9	9
Assessment	1	0	1	0
Distracted	7	4	6	10
Waiting	8	9	7	8
Filling in	1	1	1	1
Out of the room	7	7	5	8

The findings indicate a considerable degree of consistency across the age groups. Pupils spent, on average, about two thirds of their time 'on task'. If anything, this figure may be

an underestimate since it excludes time out of the classroom when pupils, in many cases, are likely to have been 'on task' with another teacher. Also, it is arguable that 'managing', as defined, can be regarded as being 'on task' since this activity is essential to the task (Pollard *et al*, 1994). However in terms of actual learning activities it can be treated separately and we continue to do so here.

More detailed analysis of patterns of pupil activity for individual schools revealed smaller variation across schools than was found for other dimensions of pupils' experience (see Appendix D, Figure D.3). However, the differences across schools for engagement on task, varying from 56%, as the lowest, to 84%, as the highest, are statistically significant. When the effects of school, sex and ability were investigated, only the differences among schools were significant statistically (see Appendix C). There were no over-riding differences between boys and girls, or among pupils in different ability bands, in relation to task engagement.

Table 2.2 shows the result of exploring differences in proportion of time on task according to ability and gender of target pupils.

Table 2.2: Percentage of time spent 'on task' by pupils in different ability bands, overall, by P level and by gender

Ability	Below average			Average			Above average		
	Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both
P1	71	55	63	63	59	61	69	60	65
P4	66	73	70	78	67	73	74	72	73
P7	61	65	63	54	61	58	66	66	66
All	66	65	66	65	63	64	70	61	66

Table 2.2 shows no consistent pattern, either according to Primary level or gender, suggesting that other factors which determine on task behaviour over-ride age or gender.

Table 2.3 shows the breakdown of on task activity into generic activities, again overall and by P level.

Table 2.3: Percentage of 'on task' time spent on different activities overall and by P level

Pupil activity	Overall	P1	P4	P7
Reading	6	4	6	7
Writing	19	7	22	27
Talking	5	5	5	6
Listening	35	40	35	29
Drawing	9	11	10	6
Read + Write	3	1	1	6
Talk + Listen	1	1	1	2
Read + Listen	1	1	1	1
Write + Listen	1	0	1	1
Using equipment	14	20	12	9
Using computer	2	3	0	2
Singing	2	3	3	1
Physical activity	3	4	3	3

The proportion of on task time spent on reading and writing increased from the P1 to the P4 to the P7 class, whilst that spent on using equipment declined. There was also a small decline in the proportion of time spent listening to the teacher by the older pupils, perhaps reflecting their ability to undertake activities more independently and without as frequent instructions from the teacher.

2.5 Time spent by pupils in various forms of interaction with the teacher and with each other

The physical arrangement of the classrooms in which pupils were observed has already been reported in section 2.3, where it was noted that classroom organisation did not necessarily relate to the type of interactions experienced by the pupils either with each other or with the teacher. We now focus on the nature of these interactions. Three categories of interaction were recorded: interaction with the class teacher; no interaction with the class teacher; interaction with another adult or teacher in the classroom. The categories were subdivided as follows:

Interaction with the teacher

- *One-to-one with the class teacher*: The pupil had the class teacher's attention as an individual, not as part of a group.
- *With the class teacher in small group*: The teacher was working with or addressing the group of which the target pupil was a member.
- *With the class teacher in the whole class*: The teacher was addressing or instructing the whole class.

No interaction with the class teacher

- *Alone*: The pupil was engaged on an individual piece of work and was not interacting with peers or the teacher.
- *Social interaction*: The pupil was working on an individual piece of work during which there was chatting or non-verbal interaction with those pupils nearby; the interaction could be either task related or non-task related or concerned with some other matter.
- *Collaborative work*: The pupil was working with one or more others on a task which required collaboration in order to produce a shared outcome.

With other adult or teacher

- The pupil was with a visiting adult or another teacher, engaged in interaction either as a number of a group or as an individual.

When either collaborative work or social interaction was observed, a record was made of whether this was in a same sex or mixed pair or group.

The findings for kinds of interactions using these categories, averaged over the twelve schools and across the four schools for each Primary level are given in Table 2.4.

Table 2.4: Percentage of time spent by pupils in various forms of interaction overall and for each P level

Pupil interaction	Overall	P1	P4	P7
With class teacher	41	43	44	37
1 to 1 with class teacher	2	2	3	2
Group	7	9	6	7
Whole	32	32	35	28
Without class teacher	42	43	46	43
Alone	23	20	27	29
Social interaction	13	17	14	9
Collaborative work	6	6	5	5
With other teacher/adult	*8*	*11*	*3*	*9*

Note: Records of interactions could not be made when target pupils were out of the room and so percentages in Table 2.4 do not add to 100.

The time spent in some form of interaction with the class teacher was, overall, about the same as the time spent without teacher interaction (about 40% in each case). P7 pupils spent slightly less time in interaction with the class teacher than P1 or P4 pupils. It is also clear that, at all Primary levels, the largest proportion of the pupils' interaction with the class teacher was as part of the whole class. This seems a disproportionately large amount of time compared with the group interaction, given that classrooms were arranged to facilitate group work rather than whole-class work. P7 pupils experienced less whole-class teaching than the younger pupils, perhaps, as Pollard *et al* (1994) speculate, because activities such as story reading and exchanging news are more common in classes of younger pupils.

More detailed analysis showed considerable variation among schools, (see Appendix D, Figure D.4) particularly in the amount of whole-class interaction with the teacher at P4 and P7, which was statistically significant. However, investigation of the effect of the other variables - sex and pupil ability - showed no statistical difference (see Appendix C for details).

In all schools, one-to-one interaction with the class teacher was a fairly rare experience for pupils, occurring on average for 2% of the observed time. Given that one-to-one interaction between teacher and pupil is often held to be among the most valuable forms of learning experience, this form of interaction was examined to see if there were differences for pupils in different ability bands or for boys and girls. Analysis revealed that, at P1, the more able boys experienced a higher proportion (3%) of one-to-one attention than the average ability boys (2%) or below average boys (1%). For girls the reverse was true, the average and more able girls experiencing less (1%) than the below average girls. However, because of the low percentage of one-to-one interactions with the teacher for any pupil, these differences were small in terms of real time. Patterns were less obvious for P4 and P7 classes, but across all levels, the more able boys experienced more one-to-one interaction than the more able girls. The unstructured observations suggested that the able girls demanded less attention from the teacher than the able boys and that the teachers' actions reflected this.

Turning to the categories of interaction without the teacher's presence, it is clear that considerably more time is spent by pupils on individual tasks, either working alone or with some social interaction with others nearby, than is spent on collaborative work, which occupied target pupils for about 5% of the time on average. However, there was wide variation across schools in relation to collaborative work, from less than 1% to 15%.

2.6 Percentage of time the teacher is engaged in different activities when in interaction with the target pupils

We now look in more detail at the nature of interaction between the teacher and the target pupils. These findings combine one-to-one, group and whole-class settings in which the target pupils experienced interaction with the teacher. The categories used for recording these observations were the following:

- *Managing (MG)*: The teacher was giving instructions at the start, during or at the closing stages of an activity, or was monitoring progress and keeping pupils on the intended track.
- *Teaching (TG)*: The teacher was instructing, giving information, demonstrating, questioning, observing and eliciting pupils' performance directly related to the learning goals of the particular activity.
- *Recording/assessing (AS)*: The teacher was involved in explicit assessment, marking, recording work either formally or informally.
- *Pastoral (PA)*: The teacher was concerned with pupils' feelings, investigating a pupil's personal problem and perhaps offering advice or comfort.
- *Control (CO)*: The teacher was controlling, admonishing or rewarding pupils' behaviour.
- *Organisation (OR)*: The teacher was engaged on organising the room, or materials or was engaged in administrative tasks.
- *Unrelated (UN)*: The teacher was dealing with interruptions, visitors, or other matters unrelated to the on-going work.

These are the same categories as the main ones used for reporting teachers' activities by the observer who was focusing on the teacher. However it is emphasised that the focus here was what the teacher was doing at the time of interaction with target pupils and says nothing about the teacher's activities at other times. These overall teacher activities are reported in Chapter 4.

Table 2.5 presents the percentages of the time the teacher was engaged in different activities when in interaction with target pupils, averaged across all twelve classes and for each Primary level.

Table 2.5: Percentage of time spent in different activities by the teacher when in interaction with the target pupils

Teacher activity	Overall	P1	P4	P7
Managing	32	32	27	36
Teaching	56	60	60	49
Assessment/recording	2	0	2	4
Pastoral	2	1	0	4
Control	1	1	2	0
Organisation	7	7	6	7
Unrelated	1	1	2	0

There is a lower level of teaching and a higher level of managing for P7 than for the younger pupils. This may indicate that the older pupils do more of their learning from sources other than the teacher, whose role is then more concerned with providing and managing these sources. However if 'managing' time is added to 'teaching' time, since both are task-related, we find that about 90% of the interaction time is concerned with learning related to the task. More detailed analysis showed that while the combined total of teaching and management time across schools is relatively consistent, the way in which the time is divided between teaching and managing varies considerably. (See Appendix D, Figure D:5). In Chapter 4, we look in more detail at how teachers used their classroom time, drawing on the teacher observation data.

2.7 Summary

- There was considerable divergence from the 5-14 guidelines on time for each curriculum area in the classes observed in the week in which the observations were carried out. In particular:
- Pupils spent about a third of their time on explicit language activities, almost all concerned with learning English.
- P1 pupils spent less than the time suggested in the 5-14 guidelines on mathematics, whilst P4 and P7 pupils spend a little more than the guideline figure.
- Time spent on Environmental Studies was consistently lower than the 5-14 Guidelines.
- In P1, pupils generally spent most of their time seated in mixed-ability groups, whilst P4 and P7 experienced ability grouping for about a third of their time on average, with considerable differences from school to school.
- There was more frequent whole-class teaching in P1 than in P4 and P7.
- Overall, pupils were 'on task' for two thirds of their time and engaged in related 'managing' activities for a further 10% of their class time. There were no consistent variations with age or pupil ability in relation to on task behaviour.
- Older pupils spent more time on reading and writing and less time using equipment and listening to the teacher than younger pupils.
- Target pupils spent about the same amount of time in interaction with the class teacher as they did working independently of the teacher (either on their own or with other pupils).
- By far the greatest amount of time spent in interaction with the teacher was as part of the whole class. Total teacher interaction (one-to-one, group and whole class) was 44% of the target pupils' time in P1 and P4 and 37% in P7.

- Above average boys experienced about three times as much one-to-one interaction with the teacher than the above average girls, but the total amount of time spent on one-to-one interaction was very small.
- When in interaction with the target pupils the teacher was 'managing' the activities for about one third of the time and teaching for about 60% of the time for P1 and P4 pupils; in P7 the proportion of time spent on teaching was lower and on managing was higher.

2.8 Implications

- Since target pupils in the observed classes were already spending, on average, a third of their time on language, improvement in performance in this curriculum area is more likely to be achieved if attention is given to how this time is spent rather than on increasing the amount of time allocated and thus further squeezing the time for other subjects, particularly environmental studies.
- Given the advantages claimed for collaborative learning, and the evidence of its positive effects, attention needs to be given to increasing the time spent in genuinely collaborative activities.
- Teachers may need to monitor pupils' individual and group work and take steps to reduce social interaction which is not task-related, and so increase time on task. This issue is examined in more detail in the next chapter.

3 Supporting Learning

3.1 Observing learning

What classroom conditions facilitate pupil engagement on task? In the last chapter, we saw that, on average, target pupils in our twelve schools spent around two thirds of their time on task, although there was significant variation across the schools. In this chapter, we focus on the relationship between classroom interaction and task engagement. Are certain types of interaction more likely to promote task engagement than others, and if so, why? Classroom interaction is only one of a number of school features likely to influence task engagement - school ethos, curriculum content and choice of teaching approach, among others are undoubtedly also factors. However, we have chosen to concentrate on interaction at this stage in our analysis because of the particular significance given to interaction with the teacher in earlier observation studies, most notably ORACLE and PACE discussed in Chapter 1. Both suggest that high levels of task engagement are linked to whole-class teaching. We were interested in discovering whether our data would lead us to the same conclusions.

The 'engaged on task' (ET) measure is the closest researchers can come to whether pupils are learning or not. It is not possible, through observation alone, to determine exactly what a pupil understands about the task upon which s/he is engaged, or how pupils are incorporating that understanding into the 'bigger picture'. To know the full range of the individual pupil's capacities, and to judge whether or not the tasks set extend these, is beyond the scope of visiting researchers.

However, we consider that the time pupils spend 'on task' may be regarded as a 'proxy measure' for learning. It is when pupils are engaged on task that they are - overtly - in a position to learn. The other activities recorded in the course of observing pupils (managing the task, distracted, waiting, filling in) constitute either preparation for learning (but not learning itself), or the absence of overt learning. We cannot, of course, tell what pupils are thinking about when they are doing these things. However, when pupils are 'on task' this is the time when opportunities for learning are most clearly marked.

In this chapter, we look first, specifically, at what our quantitative data tell us about the relationship between classroom interaction and task engagement. We then look more generally at ways of optimising conditions for learning in the classroom, drawing both on the quantitative data and some of the qualitative evidence gathered through descriptive observational accounts and teacher interviews.

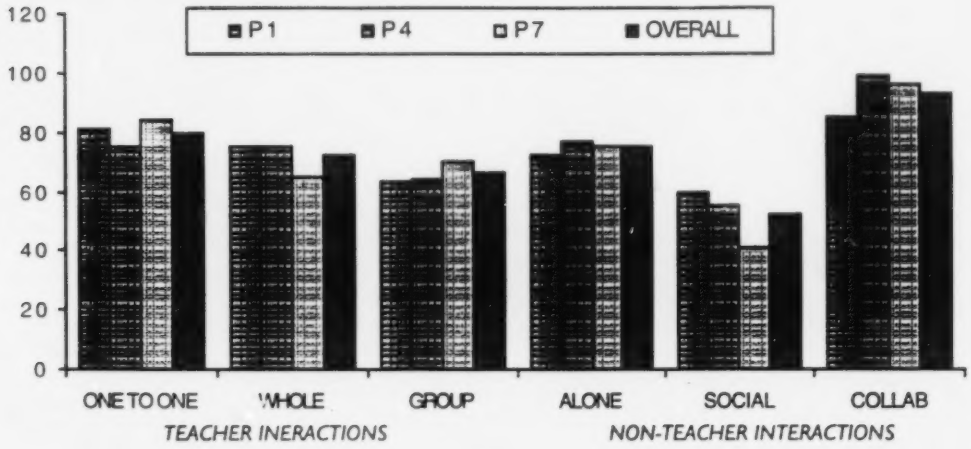
3.2 Classroom interaction and time on task

The overall picture

Our data show that pupils were most consistently engaged on task when working on collaborative activities, and when in one-to-one interaction with their class teacher. They were least likely to be engaged on task when working on their own while interacting socially with other pupils. Figure 3.1 below shows the average proportions of time pupils

in the different year groups and over all the twelve schools were engaged on task when working in each of the types of classroom organisation studied: working alone, working on individual tasks while interacting socially with other pupils, collaborative work, working one-to-one with the teacher, working in a small group with the teacher, and working as a whole class with the teacher. (See section 2.5 of the previous chapter for descriptions of these categories.)

Figure 3.1: Percentage of time spent by target pupils engaged on task when in various forms of interaction averaged across schools for each P level and over all twelve schools



As we saw in the previous chapter, pupils spent almost the same amount of time working in circumstances where they were interacting with the teacher in some way, as they did in circumstances where they did not interact with the teacher. This comprised about 40% of the time in each case; the remaining time was spent with other teachers or visiting adults, or out of the classroom for a variety of purposes.

We look first here at some of the issues raised by the extent to which pupils were on task when interacting with the teacher - ie when they were working one-to-one with the teacher, in small groups or being taught by the teacher as a whole class; and then at pupils on task with no teacher interaction - when working alone, when engaged in collaborative activities, and when working in circumstances which permitted social interaction with other pupils. We then consider situations where pupils were not on task.

On task, working one-to-one with the teacher

Most of the time teachers spent in direct interaction with pupils was in the context either of whole-class or small-group work. Working one-to-one with the teacher was a relatively rare experience: on average, observed pupils in our study spent 2% of their time over the week working in this way. Pupils were highly likely to be on task when working one-to-one with the teacher; on average, they were on task for 80% of the time and most of the remainder was spent on task management.

Teachers may be surprised at the limited amount of time pupils experienced one-to-one teaching. Some of the teachers we observed spent long periods of time working with individuals. However, clearly, the amount of time which any one pupil experiences one-

to-one with the teacher may be quite small. Some teachers, particularly those with large classes, were conscious of the impossibility of spending meaningful time with individuals: for a teacher with a class of 30 to spend five minutes a day with each pupil individually would take up half the day.

The amount of one-to-one interaction a pupil might expect depends on the individual needs and work patterns of each pupil as well as the general methods of organisation adopted by a class teacher. These relate to teachers' interpretations of their own role and the degree of autonomy they expect of their pupils. It may be the case that certain pupils need individual attention in order to work effectively and that teachers are quite well aware of the fact that they are not dividing the time they have to work with individuals equally among their pupils. It may be that some pupils ask for individual attention and others do not: this needs further investigation, specifically from ability and gender perspectives.

On task, in whole-class situations

In whole-class situations target pupils were observed on task on average 74% of the time. As we saw in Chapter 2, whole-class teaching is the dominant form of classroom interaction, taking up, on average, around a third of the available time, although patterns vary from school to school. The higher than average level of task engagement which whole-class teaching produces is therefore an important - and reassuring - finding, given the amount of time pupils work in this way. As noted earlier, other observation studies have reached similar conclusions.

On task, in groups

Pupils were less likely to be on task when working in groups with their class teacher than when interacting with the teacher in a whole class context; even so, they were on task for more than 60% of the time. Most of the time, when the teacher worked with a small group, these were ability groups, used mainly for language and maths activities, where the teacher organised activities such as hearing children read, teaching new skills, giving instructions and checking understanding of tasks to be completed in workbooks or elsewhere, negotiating assignments for the day or the week ahead. It was relatively rare for the teacher to teach small mixed-ability groups.

During these activities, teachers frequently focused attention on one pupil at a time: for example, requiring a pupil to sound out the letters/syllables making up a word, or to explain what they had written. Others in the group usually followed the discussion or listened to their peers reading aloud, but sometimes they were distracted, especially if they could not progress until the one child's difficulty or need had been settled. This feature of small group work goes some way to explaining why it appears to be the least successful form of teacher interaction, in terms of pupils' engagement on task. However a major element of small group work was organising work which pupils would then complete on their own, so that a proportion of the time which pupils spent in small groups involved going over instructions, checking equipment etc, and would therefore have been recorded as 'task management' rather than 'on task'.

On task, working independently of the teacher

When pupils were not interacting with the teacher, they were either working on their own or in small groups. When working alone, target pupils were, on average, engaged for 75% of the time. When working on individual tasks, but interacting socially with other pupils, they were observed to be on task, on average, 49% of the time. The data show a marked decline in the extent to which pupils were 'on task' when socially interacting, in relation to Primary level: from 60% of the time in P1 to 39% of the time in P7.

Seating arrangements had an important part to play in determining the extent to which pupils worked alone in silence, or were working in circumstances in which they could talk to other pupils (ie in situations which allowed for 'social interaction'). The norm in the classes we visited was for pupils to be sitting in mixed-ability groups. In some classes, pupils sat in groups which reflected language or maths ability groups. None of the classes we observed used seating arrangements which would clearly indicate an expectation that pupils should work on their own in silence (ie separate desks arranged in rows).

For a substantial amount of time pupils were engaged as individuals on work differentiated by ability (ie whenever they were working on language or maths tasks set by the teacher for them to work on by themselves). Whenever this was the case, the mixed-ability seating arrangements clearly did not support discussion about the work among those engaged on the same tasks as members of the same ability group were likely to be spread across the room. These arrangements did, however, encourage greater social cohesion for the class as a whole: if they sat in ability groups their contacts with pupils outside the group could be very limited. Mixed-ability seating also allowed able pupils to help others with their work, on occasion. One P1 teacher commented on the importance of mixed-ability seating arrangements:

> *I usually say to them 'Choose where to sit. If you're happy at your table, that's fine. But try and sit beside someone you don't know very well and get to know them.' I also say 'If you are not happy, we can change it.' That helps them to be more ambitious [in terms of sitting beside people they don't know]. ... I don't really like them sitting in ability groups. I feel that social grouping is much better. They learn different things from different children.*

Thus, in some cases, pupils were in a position to interact with others and yet be on task: in such cases, the conversation would focus on aspects of the task all were engaged in. In other cases, this was more difficult, as those round about were engaged on a range of different tasks. In these cases conversation might relate to informal support for each other's work, or might be unconnected with the task. However, there was considerable variation across curricular areas and across schools, with one P4 class being expected to work silently. Sometimes pupils might interact with the person next to them, sometimes with a whole group of pupils. Generally speaking, paired interaction involved another person of the same sex, while group interaction was with a mixed sex group. Variation in the amount and nature of the interaction was determined by a combination of teachers' expressed preferences, physical seating arrangements, composition of groups and individual pupils' own preferences.

The decision to work without talking rather than while socially interacting with others was thus primarily one taken by the pupils themselves rather than the teacher. The teacher might indicate in certain circumstances that there was to be no talking, or might intervene if noise levels were high and pupils appeared not to be on task, but, generally, a certain level of talk was acceptable and indeed condoned by the seating arrangements and by teachers' views that pupils benefit from social contact in the classroom.

While it may seem obvious that pupils who are working and socially interacting are less likely to be on task than those who are working alone, the reality is more complicated. The researchers observed pupils apparently working on their own and not talking to others, who were nevertheless primarily engaged on peripheral activities: sorting out pencils, arranging books, spending considerable time on elaborate lettering for title pages, etc. They also observed pupils apparently engaged in lively conversations or heated arguments which, from a distance might suggest a failure to concentrate on the task in hand, but

which, when audible, revealed that the topic was the work in question and that pupils were deeply engaged. Because the researchers could not always be in a position to hear what pupils were saying, it was always not possible to know whether pupils were talking about work or about other matters.

On task, in collaborative learning

Pupils were most consistently engaged on task when involved in collaborative learning activities: P1 pupils were on task for 85% of the time, the figure rising to 98% for P4 pupils and falling slightly to 96% for P7 pupils. For each year group, this was therefore the most 'successful' activity, in terms of ensuring that pupils were on task.

In the literature, collaborative work is well-established as an approach which promotes and enhances learning through independent thinking and active involvement (for instance, see examples in Foote et al, 1994) but it is also the case that teachers have found it difficult to operate in practice. Therefore, despite the benefits, this approach has tended to be used relatively rarely. Collaborative learning was also unusual in the schools visited for this research, as we saw in Chapter 2. Overall, it accounts for only 6% of the target pupil observations. In interview, some teachers revealed that they were wary of promoting collaborative work. While some P1 teachers felt pupils were too young to work in this way, some teachers of older pupils felt that they could not use the method because pupils were not used to it. In contrast, one P7 teacher who used the approach extensively explained that because collaborative working was developed from the earliest years in her school, pupils were familiar with the approach and it was not difficult to organise pupils into groups and to set joint tasks.

Collaborative learning was not associated with any one curriculum area. Although it was rarely used, the data include examples of collaborative work in each of the main curriculum areas. Thus the principal factor influencing teachers' decisions to use collaborative learning would appear to be their familiarity with the method rather than the view that it is a 'specialist' approach suitable only in certain subjects.

Time not spent on task

Another way to approach engagement on task is to consider the extent to which pupils are not working when they should be. Routines established by the teacher have a part to play here - for example while teachers organise their classes in various ways to avoid time being wasted as pupils wait for attention, some of these are more successful than others. In one school, the teacher set out all the tasks to be done at the start of the morning and then 'patrolled' the room checking that pupils were able to get on with their work and were doing so. This room was extremely quiet and there was little indication of distraction.

Some pupils, however, have developed 'work avoidance strategies' which exploit teachers' routines. In one school, one of the target pupils used 'waiting time' strategically. He was observed to spend a substantial amount of time waiting in line when working with teachers other than his class teacher (whose routines precluded this type of behaviour and who was aware of the pupil's delaying tactics). His technique was to ask the teacher a question, return to his place briefly, and then to go to the back of the queue again. Here he resumed his apparent wait for help and enjoyed talking with other pupils in the line and watching others' interactions with the teacher. His questions of the teacher seemed to be fairly trivial given his normally demonstrated performance and he spent little time actually working on the task in hand. The following extract from the field notes illustrates the technique.

Extract 3a: Example of pupil task-avoidance strategies

F is a P7 boy, taking part in a Gaelic lesson taught by visiting specialist. Pupils have been asked to learn a poem by heart.

- F decided that work was too hard but told Gaelic teacher that he was too shy to say the poem in Gaelic. He waits in line but when his friend's work is discussed, F joins in conversation. F gets own request seen to - how to pronounce a word. Returns to teacher for more help within 30 seconds. Teacher deals with query very pleasantly and makes lots of positive comments to F. Not sure that F understands all explanations.
- F keeps an eye on the time and goes to check another pronunciation. Seems to be clear that this an effective strategy to keep out of trouble. Chatting to friends indicating that it is 17 days till his plaster cast comes off. Sits fairly quietly on his chair monitoring what the teacher is doing.
- Tells teacher that knows first three lines and she asks him to learn next three.
- F very self consciously reads piece to teacher but is constantly monitoring other children's reactions to his reading. As teacher leaves him, he temporarily seems interested in what he is doing. Just begins to drift off again when she comes by and he asks to read to her again.

3.3 Optimising conditions for learning

The evidence presented in this chapter confirms that observed pupils were likely to be on task in a range of classroom situations. Teachers used their professional skills in adopting strategies which would:

- support learning for all the pupils in the class
- encourage all-round development of these pupils
- maximise circumstances likely to engage pupils in learning.

Common to all classrooms observed were variations within overall stability and routine. Pupils worked in whole class, mixed or ability groups with the teacher, or independently, alone or in small groups; but every day, this variation took place within established routines. For example, in most classrooms, each pupil had a regular 'home' place but would adapt to a range of other temporary arrangements for particular tasks, eg ability group work with the teacher. Other important routines include clear protocols on what to do with completed work or how, and when, a teacher should be asked for help or interrupted. (Visitors unused to primary classrooms might be surprised by the amount of purposeful moving around that takes place as pupils get out or replace equipment, use dictionaries, consult peers, move to specialised areas of the room - eg the computers, home corner, construction toys, go to the toilet without having to ask permission from the teacher.) With these routines established, pupils take considerable responsibility for organising their time in the knowledge that teachers have firm expectations of the range and amount of work to be completed during a session. Routines, essential to the smooth running of the classroom are important in freeing teachers to concentrate on teaching and supporting learning and in enabling pupils to engage with their learning tasks.

In some circumstances, fixed routines risk becoming inflexible and tedious. For example, extensive use of language and mathematics workbooks guarantees systematic approaches to these curricular areas but may lead to the development of a rather narrow range of learning strategies focused on the kinds of tasks that can be accomplished solely

by pencil and paper exercises. A systematic approach to learning through structured materials may be an essential aspect of school learning but may not encourage pupils to develop other valuable strategies - such as group problem-solving.

Collaborative activities which require small groups to resolve problems certainly engage pupils in their tasks and the question remains as to why they are not used more extensively in primary schools. Some of the hazards are apparent: it may be difficult for teachers to be as confident about what children are learning compared with situations where they are, for example, on page 7 of a workbook; assessment of individual performance is also difficult; many teachers do not find it easy to organise collaborative activities likely to engage and stretch pupils of all abilities. Nevertheless our data show that pupils of all ages and abilities are on task in collaborative work and the challenge for teachers is how to take more advantage of this.

One of the skills observed in target pupils was their ability to monitor what the teacher was doing and how this related to themselves. Some pupils, as we have seen, monitored the teacher in order to avoid work. There were also many instances of diligent pupils having to interrupt their own work in order to listen to the teacher in case the teacher's comments or instructions were relevant. Commonly teachers would address a remark to a particular child or group in a voice loud enough for the rest of the class to hear and therefore potentially to be distracted. In some schools we observed distinct spelling/ dictation tasks addressed to two or even three groups (eg 'Green group, spell *family*; Red group, spell *going*.'). Thus while a pupil in the green group was trying to write family correctly, s/he was also hearing *going*.

Skilful information processing is thus essential for pupils to follow teachers' instructions, and is also important in life outside and beyond school. However teachers might consider ways of making classrooms less distracting and more likely to support pupils in keeping on task. One classroom was characterised by a deliberately quiet teacher who seldom addressed the whole class or commented to a pupil across the room while the class was working. Ways of minimising disruption include the teacher moving to where their pupils are working rather than remaining in a central position; and using non-verbal signals to communicate the need for pupils to attend to their work or move on to another task etc.

Activities such as spelling or dictation might be conducted in ways that are less distracting for non-participating pupils. Adopting a pupil-led approach, or making use of IT for these activities might also free teachers for other work; and the use of IT could enable pupils to monitor and evaluate their own performance at the same time as making a record of progress and attainment accessible to teachers and others for subsequent reference.

Evidence from this study shows that while all teachers had extremely busy days at school - managing complex classrooms and having to make rapid successive judgements - the extent to which their pupils were engaged on task varied considerably. Should we interpret the finding that target pupils spent around two thirds of their time on task positively or negatively? One argument for a positive interpretation is that our findings here indicate a higher level of task engagement than the 59% found by Alexander in the PRINDEP study (see Chapter 1). We should also ask ourselves how much time, as adults, we spent engaged on task, when studying or at work. However, it is clearly possible to increase the amount of time pupils spend on task and the evidence discussed in this chapter points to some of the ways this could be done.

3.4 Summary

- However classrooms were organised, target pupils spent most of their time engaged on the learning tasks set up by their teachers.
- Activities which were most successful in ensuring that pupils were on task were collaborative learning activities and one-to-one work with the teacher. However, both of these ways of working were relatively rarely observed.
- Target pupils were on task least when working on individual tasks while engaged in social interaction with other pupils, and when working in small groups with the teacher - in the latter case, these groups were usually based on ability, specifically for language and mathematics, and a substantial amount of group teaching time focused on task management.
- Teachers organise classrooms in ways likely to promote routines and systematic learning. Such approaches aim to maximise the amount of time teachers can spend teaching and pupils can concentrate on the task in hand. There is a danger, however, that some approaches result in a narrow repertoire of potential learning strategies and even tedium for pupils.

3.5 Implications

Target pupils in this study were on task for about two thirds of the time they spent in the classroom. We noted that this may be around the norm for primary children. However, clearly, teachers will want to find ways of enhancing task engagement. That some classes can achieve higher levels of engagement on task is evident from our findings. Target pupils in two of the twelve classes were recorded as being engaged on task for over 80% of the time, on average, over the observation period. The findings reported here suggest that teachers could enhance task engagement by:

- increasing the amount of collaborative learning taking place in the classroom
- reducing - perhaps by changing aspects of classroom organisation - opportunities for children to work in environments which encourage social interaction which is not task-related
- reviewing the ratio of teaching time to task management time when working with ability groups
- reviewing the effectiveness of established routines in relation to maximising the amount of time pupils can spend on learning
- considering ways in which IT can be used to support learning activities.

4 The Teacher's Day

4.1 Teachers' work in the classroom

This chapter considers the range of activities to which the teachers in our twelve schools devoted their time in the classroom.

Clearly, the main task of the teacher is to teach. However, teachers need to organise the classroom and their pupils in ways which allow teaching and learning to take place. Some of their time, therefore, is taken up in managing learning tasks, and they also have to measure pupils' progress in the tasks they have set them, by assessing their work, formally or informally, and recording this information. These were tasks we regarded as related to teaching.

In the course of their work, teachers also have to ensure that pupils' behaviour is such that they can concentrate on learning. Much of this is done through preventing problems arising and through the establishment of supportive routines. Nevertheless moments of disruption occur, and teachers have to 'control' the class in order to ensure that work can continue.

Another important aspect of teachers' work is pastoral care. Children have needs and concerns other than the purely academic and teachers have traditionally recognised their role in loco parentis and accepted that time needs to be spent dealing with relationships among pupils or domestic problems which affect pupils' ability to work well at school. Teachers also have to spend time on administrative matters relating to the class, or more generally, to the school. These are usually mundane tasks, such as taking in dinner money, or tying the shoelaces of those who have not yet mastered this skill. While recognising classroom control, pastoral work and administration as important, or at least inevitable, we did not regard these as, strictly speaking, connected to the curriculum: thus these aspects of the teacher's work are defined as 'non-curricular' activities.

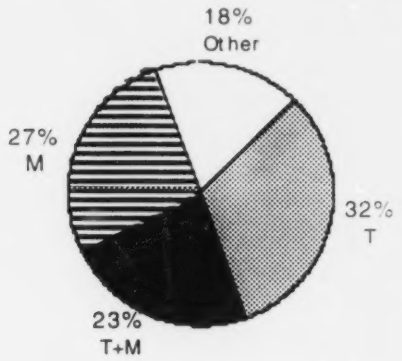
In recent years, there have been claims that such 'non-curricular' activities (whether coping with a heavy administrative workload or dealing with an increasing range of domestic problems which pupils bring to school) are taking up ever greater amounts of the time teachers should be devoting to delivering the curriculum. The focus of this chapter is on the balance of teacher activities we observed and whether such concerns may be justified.

4.2 The overall picture

The activity on which our teachers spent most time was teaching (T). If the amount of time teachers spent on teaching (T) and managing (M), separately or simultaneously (T+M), is included in the calculation, it still emerges from our data that the bulk of teachers' classroom time was spent on teaching and related activities.

An overview of how teachers allocated their time is shown in Figure 4.1 on the next page.

Figure 4.1: Overall average allocations of teachers' time to teaching and managing



Teachers spent almost a third of their time in the classroom teaching (32%). Almost as much time was spent on managing learning tasks (27%). It was also common for them to teach and manage simultaneously: for 23% of the time, we recorded both activities occurring within one minute. Just under a fifth (18%) of their time was spent on activities other than teaching or managing, the bulk of which was administration.

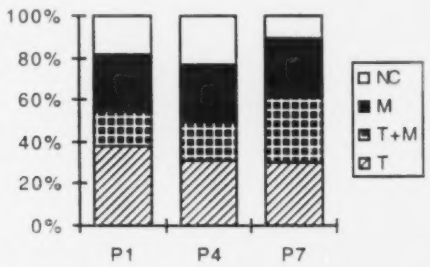
In the next section we look at activities related to teaching: managing and recording and assessment. We then go to look at the time teachers spent on non-curricular activities. Teaching itself is considered separately in Chapter 5.

4.3 Activities related to teaching

On average, over four fifths of our teachers' time in the classroom (82%) was spent on teaching and related activities. As we have seen, managing learning tasks took up almost as much time as teaching, and teachers often managed and taught at the same time.

The pattern for teaching and managing learning across the three year groups is shown in Figure 4.2 below.

Figure 4.2: Time spent on teaching and managing learning activities in the three year groups



Our data show little variation in relation to the age group taught. While teachers spent a little more time on teaching in P1 (38% of classroom time) compared with P4 (31%) and P7 (30%), the time spent on managing learning is almost the same (28% in P1, 27% in P4 and P7). However, teachers in P7 spent almost twice as much time teaching and managing simultaneously as teachers in P1 (31% in P7, compared with 16% in P1; the figure for P4 was 19%), suggesting a rather different way of working in P7 compared with the younger

age groups. As we shall see in the next chapter P7 teachers, when teaching, spent more time 'facilitating learning' than they did on 'instructing' directly, and it may be that there is a link between this finding and teaching and management patterns.

Managing learning consisted of setting up tasks, giving instructions about how to complete them, keeping pupils on task, monitoring them as they work (in the sense of checking that they are on task, rather than monitoring their progress for assessment purposes) and bringing tasks to an end. The finding that managing learning took up almost as much time as teaching may be unexpected. In our view, this raises a complex question of how teaching and managing learning are related to what pupils know and how they learn. In the course of this study, we noticed different 'philosophies' of learning in the teachers we observed. Some encouraged pupil autonomy while others preferred to retain tight control of events in the classroom. Our data suggest that both perspectives were likely to produce a high management: low teaching ratio, but that the implications for pupils' learning would be quite different.

In the case of teachers who encouraged autonomy, their management of pupil learning could involve the setting up of relatively complex tasks which, because of their complexity, might be time-consuming to manage. For example, one P7 teacher operated a system where pupils were set targets for their work in language and maths for a week at a time. This involved extensive discussions with pupils, usually in small groups, reviewing the work which they had done, discussing what they had found easy and difficult, looking at text books and other resources available and linking these with the 5-14 levels towards which they were working. The pupils in this class were clear about what they had covered and what had to be done before they would sit the relevant level test. Much of the teacher's work in this context was classified as 'managing learning'. Sometimes the discussion would involve elements of teaching as well, but in general, teaching sessions were separate from pupil target-setting sessions. When setting targets and planning their week's work, pupils identified points at which they felt they would need sustained input from the teacher and these were included in the plan for both the pupils and for the teacher. It seems likely that because of the autonomy pupils were granted in this school, and the responsibility they took on themselves for their own learning, they required fewer teaching sessions than a teacher might have felt necessary in other circumstances.

Teachers who preferred tight control might also work for a substantial period of time with small ability groups, but they used this time to tell pupils what to do (rather than to discuss possibilities). As we saw in the last chapter, pupils were recorded as being least 'on task' in small group sessions, precisely because much of the time they were with the teacher consisted of being shown the tasks they were undertake on their own, and going over instructions (defined as 'task management' rather than 'engaged on task'). Again, these sessions could involve teaching as well as managing but, in many cases, the main aim of such sessions appeared to be to set pupils up with work which they could then continue independently while the teacher moved on to another group. In this context, the tasks which pupils were set to work on independently were often relatively easy, although they might be time-consuming. For example, pupils might be set a page of maths problems, all of a similar nature, rehearsing the same concept several times over. It is, of course, important that pupils practise basic skills in maths and language in particular. Spelling, punctuation, correct sentence formation and arithmetical functions, for example, are all best learnt by doing rather than by being taught. At the same time, we noted that, for reasons of classroom management, it is not in teachers' interests to make the tasks they

set for pupils on their own too challenging since pupils will find them difficult and need to ask for help more often. In classrooms where teachers spent most of their time with a series of small ability groups, the level of interruption this would represent would be unacceptable.

Thus in the classroom of the teacher who encouraged pupils to set their own targets, we noted the teacher telling pupils to stop working through a page of maths problems when they felt they had understood the principle, and move on to something else. In contrast it was quite possible in other classrooms for pupils who finished their work quickly to be told to do another page of similar problems, until the teacher had time to set the next activity for the group. We believe, therefore, that the nature of the learning is quite different in these two situations, although in both cases, the amount of time spent on teaching and managing is quite similar.

We have very little data on the recording and assessment of pupils and have not included these in our figures. This reflects the difficulty in being able to observe teachers when they are engaged on these activities. Our data then, should not be taken as implying that our teachers spent little time on this task, but that much formal assessment and recording occurred outside of the classroom, while informal assessment was not always visible to the observer. Although the observers could see teachers looking at pupils' work, they could not necessarily tell whether this involved any form of assessment or not. It may seem evident that it does involve assessment but teachers' comments to pupils in some instances could indicate that this was not the case: they might be more concerned about the pace of the pupil's work and whether it was in the appropriate exercise book than about the quality of the work.

Formal assessment was easier to identify in some ways - for example if a teacher gave a test. But frequently, the teacher might give the test during the lesson but mark it at some other time. In such cases, was the teacher engaged in assessment when calling out questions (but unaware of pupils' responses) or only when she came to mark the test? We decided that giving the test did not, in itself, constitute assessment on the teacher's part. This view was reinforced by the fact that pupils sometimes marked their own tests or those of their neighbours and the value of the exercise was seen to lie in the pupils assessing their own progress. The teacher might pay only cursory attention to what individual pupils had achieved. Equally relevant to this view was the fact that teachers quite clearly spent a considerable amount of time outside classroom hours on marking class work and tests, and recording scores.

■ 4.4 Non-curricular activities

We defined as 'non-curricular' activities as administrative tasks, classroom control and pastoral work. On average, teachers devoted 18% of classroom time exclusively to these matters. However, they also spent time on non-curricular activities while also teaching or managing (ie both types of activity were recorded in the same minute) and it is thus not possible to give an accurate picture of how much time was spent on each type of non-curricular activity. The raw data suggest that the bulk of 'non-curricular' activity comprised of administrative tasks and that very little time was spent on pastoral work, for reasons discussed below.

Administration

Administration includes both classroom matters such as distributing exercise books, moving desks, tidying or lining up, and school administration such as taking the register,

collecting dinner money, distributing letters and so on. A certain amount of time has to be spent on these matters.

Our experience from school visits suggests that class teachers in some schools have a substantial amount of administrative work. For example, in one school, a particularly complex method of collecting dinner money had been instituted, in order to minimise disruption in the dining hall at lunch time. On one occasion, collecting the money took 40 minutes.

Classroom control

While administrative tasks tended to preclude teaching or teaching related activities classroom control tended to interrupt teaching/learning activities. Control relates primarily to disciplinary matters and usually consisted of teachers telling pupils to stop behaving in inappropriate ways (to stop talking, to focus on their work, etc). A variation was in using positive discipline approaches with a view to encouraging others to follow the example of those who have been praised.

It was not necessarily the case that the more badly behaved the pupils, the more time teachers had to spend on control matters. Those who used positive discipline approaches may also rate highly on the control scale precisely because their pupils were well-behaved. One P1 teacher operated a positive discipline approach very consistently and very effectively, as the following extract from the field notes shows.

Extract 4a: Positive discipline in P1

Class has been listening to a story on tape. Some pupils are not paying attention and are behaving in a 'silly' way.

T: I'm going to call out your names but I'm going to call them out very quietly, so you'll have to listen.
Calls out pupils one by one. 'Silly' pupils calm down. Teacher asks each pupil to get a library book. They go back to their seats to read.

T: If you're reading, you're very very quiet.
She gives stars to those who are reading quietly.

T: This is a quiet time for you and your book. You don't need to talk to anyone. You can look for some words we know, or you can look at the pictures.
A few pupils are talking

T: Oh, somebody's let me down. I'm hearing voices.
She moves around the classroom, commenting on good behaviour:

T: You're looking at your book beautifully.
Then returns to her own seat and takes out a book

T: Shh. I want to look at my book as well.
She reads a picture book in silence. All pupils now silent.
She asks everyone to stop reading.

T: Close your books. I'm going to choose a table where people were reading their books really well.
She gives stars to every table. Pupils put their books away.

Extract from the field notes, representing 17 minutes of classroom time.

Pastoral work

It was rare for the researchers to observe teachers engaged in pastoral activities and dealing with problems, usually of a social nature, which require to be investigated and resolved. Often this requires the teacher to have a detailed understanding of pupils' personalities and circumstances outside the classroom. In one of the few examples of this kind of work which the researchers observed, the class teacher was alerted to a feud between two boys in the class which had led to the other pupils taking sides and ultimately to a fight in the playground. Although she might have dealt with this as a disciplinary matter, she chose to spend a considerable part of one afternoon talking firstly to all the pupils who had been involved in the fight, investigating the causes and discussing with pupils the reasons why their behaviour (which the pupils felt was justified) was inappropriate. She then worked with the two boys, trying to get to the root of the problem, and, ultimately, setting them a construction task which could only be achieved if the two cooperated. This represented a substantial investment of class time which the teacher felt was appropriate both because of the importance of maintaining good relationships in the class and because taking action at this stage might avoid future problems.

It is difficult to determine why pastoral work was rarely observed. It may be that such events are genuinely relatively rare (and the proportion we observed thus represents the real situation). It may be that the teachers we observed chose not to deal in detail with pastoral matters while we were there. They may have perceived a risk that, as outsiders, we might not recognise the need for such interventions and judge the teacher to be wasting teaching time. Another possibility is that such events are, in a sense, private to the class and should not be observed by outsiders. In this context, we note that in setting up the visits, the researchers made clear to the teachers that should any event occur which they would prefer us not to observe or record, we would willingly leave the classroom and/or suspend the observations. We were never asked to do this. It may be that our teachers habitually dealt with such matters outside classroom hours because of the sensitive nature of this kind of work.

Unrelated activities

Our last category of 'non-curricular' activities was termed 'unrelated activities' and was also rarely observed. Almost all the recorded instances relate to interruptions over which the teacher had little control. Some teachers experienced a far higher level of interruptions than others. For example, in one school, the class we observed was in a classroom which also served as a corridor between another classroom and a staircase. This class suffered frequent interruptions as pupils from the other class or teachers passed through. Interruptions for other reasons were also frequent in this class. On one morning, between the start of the school day and break time, the observers recorded 25 interruptions, which ranged from passing traffic to the arrival of an optician who needed to test the eyesight of all pupils in the class in batches of approximately eight pupils at a time. Other teachers experienced no interruptions at all during teaching hours. These may be chance findings but it was clear to the researchers that interruptions can have a marked impact both on the coherence of the teachers' work and on pupil concentration.

4.5 Summary

- On average, teachers spent 82% of their time in the classroom on teaching and related activities. Almost one third of their time (32%), was spent exclusively on teaching, and a little less (27%) on managing learning. They were observed to be teaching and managing learning simultaneously for 23% of the time, on average.

- Teachers were very rarely observed recording or assessing pupils' work. In part, this finding represents technical difficulties in observing such activities.
- 'Non-curricular' activities - such as pastoral work, administrative tasks and classroom control - took up, on average, 18% of teachers' time in the classroom. We noted that teachers might also spend a considerable amount of time on such activities outside classroom hours. In addition, some teachers were unable to avoid spending classroom time on such matters because of the demands made on them by school administration or as a result of interruptions.

4.6 Implications

Our data show that teachers spent over four fifths (82%) of their time on teaching and related activities. In view of concerns that non-curricular activities are taking up an excessive amount of teachers' classroom time, this finding appears reassuring. However, we have no way of knowing whether teachers spent less or more time on such activities in the past; nor can we say whether the 18% spent on non-curricular activities is appropriate, economical or excessive. We were very aware when carrying out the research that teachers spent considerable time on preparation, marking and recording the work of the class, and administrative matters outside classroom hours. If teachers feel that the amount of time they are able to concentrate on their teaching has been eroded, it may be that the amount of the time they spend on administration outside classroom hours has increased, affecting the amount of time they have available for preparation, marking and recording.

Managing learning tasks takes up almost as much classroom time as teaching but we note the complex relationship between teaching and managing learning, and pupils actual learning. On the one hand the development of pupil autonomy is important and can be supported by a high management: low teaching ratio. On the other, encouraging pupils to spend long periods of time working on routine tasks well within their capabilities (even if differentiated) as a way of ensuring minimal interruption while setting tasks for a series of groups (a scenario also represented by a high management: low teaching ratio) may be wasting pupils' time (although we recognise that practice is needed to help pupils develop and consolidate basic skills).

We note that while the amount of time teachers spent overall on non-curricular activities may seem reasonable, there was considerable variation among the twelve teachers we observed in this regard. Some teachers worked in trying circumstances where administrative demands were high and complicated, or where interruptions were frequent. In other schools these problems, over which teachers themselves have little control, were much less marked. It may be appropriate for some schools to consider reviewing current practice in these contexts, with a view to minimising interruptions and maximising the time available for teaching and learning.

5 Teaching Approaches

5.1 How do teachers teach?

Teaching is complex and demanding. Teachers have to cover the relevant curriculum in a limited period of time, usually within a year, before their pupils move on to the next class. They must also ensure that all their pupils achieve what is expected of them. This requires considerable knowledge of the curriculum guidelines, of the curriculum content itself, of appropriate teaching and assessment methods and of how children learn. It requires a high level of skill to apply this knowledge to a class of children with a wide range of needs, interests and abilities. Teachers have to know themselves too - to be aware of their strengths and weaknesses. They also need to reflect on past classroom experiences in planning future work.

In this chapter, we look at the different approaches teachers use when teaching. We categorised these as:

- *instructing pupils*: transmitting knowledge, explaining points of direct relevance to the curriculum
- *demonstrating*: showing pupils what things look like, how things work or how to do things
- *facilitating learning*: helping pupils to learn by extending their thinking, challenging the outcomes or conclusions pupils have reached or encouraging them to reflect on their own learning processes
- *observing pupils*: watching or listening to them as they work with the aim of understanding how they are approaching learning tasks and using this understanding to assess their progress or to shape future work
- *eliciting pupil performance*: asking pupils to do things to show how much they have learnt.

At the time the research was carried out, there was criticism from some quarters of teaching approaches (eg The Scotsman 8.10.98). It was claimed that teachers do not engage in enough instruction to enable pupils to acquire the knowledge they will need in later life. Teachers were said to prefer to 'facilitate learning' - a practice which, when viewed from this critical perspective, was held to amount to a 'laissez-faire' approach where pupils were expected to find their own solutions to problems and consequently often failed to develop basic knowledge and skills. We were interested to see whether there was any foundation to this claim. We were also interested in the extent to which teachers create and use opportunities to observe pupils as they work in order to understand their progress and establish how successfully pupils are coping. Previous experience (eg McPake and Powney, 1998) had suggested to us that this approach is relatively rarely used by teachers, but that it is an important aspect of 'good' or 'effective' teaching. It is essential for teachers to reflect on their own practice in order to capitalise on success and avoid repeating mistakes.

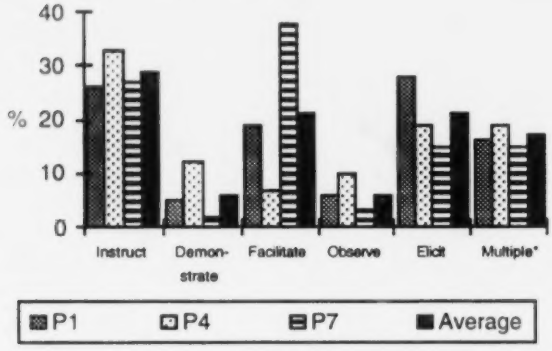
This chapter looks first at the approaches used by the teachers in our study, considering the extent to which teachers' choice of approach is determined by factors such as the age of pupils or of subject area, and to what extent it is a product of individual teacher style. Secondly, we discuss examples from some of the schools involved in the research, in order to explore the rationale for particular choices of strategy in more detail.

5.2 Teaching approaches

The overall picture

Almost all the teachers observed in our study made use - to some degree - of all of the approaches we set out to investigate. ('Facilitating' was not observed in one classroom.) The data show that 'instructing' was the most commonly used approach overall (29% of teaching time) but that 'facilitating' and 'eliciting pupil performance' were also popular (21% of teaching time in each case). Figure 5.1 presents the overall averages for each type of teaching approach, across the three year groups and for twelve teachers.

Figure 5.1: Overall averages for teaching approaches across twelve schools and three year groups



* The category 'multiple' refers to times when teachers were observed to use more than one teaching approach in the course of one minute. For reasons discussed below, such occasions often involved eliciting performance and observing pupils, but any combination of teaching approaches was possible.

Different teacher approaches predominated for the different year groups: eliciting pupil performance for P1 (28% of teaching time), instructing for P4 (33%) and facilitating for P7 (38%). Two different explanations for these differences may apply. Firstly, the different balance of curriculum areas for the three year groups may play a part in determining the dominant approaches. As we have seen in Chapter 2, expressive arts took up a higher proportion of time in P1 than it did in P4 or P7 (see Figure 2.3) and eliciting pupil performance tended to figure prominently in teaching expressive arts. However, it also seems possible that teachers changed their teaching approaches as pupils got older, moving from tighter control of pupils' learning through 'instruction' to looser control through 'facilitating'.

However, variation in the use of different approaches among teachers taking part in the study was high. This suggests that teachers' choice of approach is also a product of individual teacher style and preferences. These will be linked with their experience and understanding of how to work with the particular class and of how best to support learning in relation to the particular tasks undertaken at the time of our visit. This possibility is

explored in more detail below. Before discussing what constitutes teacher style, however, we look in more detail at what each of the teacher approaches represents in practice.

Instruction

Instruction was the most commonly used approach overall, and was a particular feature of teaching in P4. This type of activity might take the form of 'presenting' or 'lecturing', ie the 'typical' (but in fact rare) phenomenon of the teacher standing in front of the class and talking. More commonly, instruction consisted of question and answer sessions in which teachers ask pupils questions both to determine what they already know about a topic and as a means of ensuring that everyone knows the key facts or information needed for a particular activity. Instruction was not necessarily a whole-class activity; it could equally form part of a small group work session, or indeed work with individual pupils, either through the question and answer mode or through direct explanations. An example from a P4 class studying the Vikings shows how the teacher moves between presenting and question and answer sessions, in order to explain aspects of Viking religion to pupils:

Extract 5a: Instruction in P4

Teacher: Tell me what you know about the Viking gods, from what you've read.
Pupils volunteer some information about Thor and Odin.

Teacher: The Vikings were not Christians. What is the definition of a Christian?

Pupil 1: They did not believe in God.
Teacher looks dissatisfied with this explanation. Chooses another pupil

Pupil 2: They did not believe in Jesus.

Teacher: That's right. They didn't believe in Jesus. They believed in the elements around them. What is the element around you that makes most impact on you?
Various pupils volunteer answers: trees, houses, sky. Eventually identify the required answers: fire, air, water, land.

Teacher: How could they use fire?
Various pupils respond: cook, heat

Teacher: What about water?
Various pupils respond: drink, sail down the fjords, the rivers, across the ocean.

Teacher: They sailed in their longships to plunder and to trade. The elements were very important for their survival.

Extract from field notes, describing six minutes of class time

Given that 'transmitting knowledge' might be held by some to be the principal function of the teacher, it is important to note that our teachers did not always instruct personally. They frequently made use of text books or other materials, directing pupils to read the relevant passages and, usually, to complete comprehension exercises. In such cases, we did not classify the teacher's activity as instruction but rather as managing. A similar issue arose when teachers made use of videos or computer programmes to support instruction. Thus the total amount of instruction experienced by pupils was greater than the amount recorded as teacher activity.

Facilitating

The data suggest that teachers adopted different teaching approaches with P7 pupils compared with P4, preferring to facilitate rather than instruct. This may relate to the greater complexity of curriculum content at P7 compared with P4 and to a greater

sophistication on the part of pupils.

Teachers facilitated pupils' learning in a variety of ways. They asked pupils to explain their thinking or the methods they had used to reach a particular outcome or conclusion. They extended pupils' thinking by challenging their assumptions or showing that there is more to a particular issue than meets the eye (by using phrases such as 'Yes, but...' or 'What if ...?') They encouraged pupils to work out what to do next by themselves (rather than telling them) or to work out what has gone wrong and how to remedy this.

We distinguished 'facilitating' from two other teacher activities: 'instructing' and 'monitoring' (the latter is a subcategory of managing). In 'instructing', as we have seen, the teacher's role was to transmit knowledge, on the assumption that the teacher had the necessary knowledge and had either to pass this on to pupils (who did not yet have this knowledge) or to check that pupils had acquired the knowledge they needed. Thus question and answer sessions classified as 'instruction' were tightly controlled by the teacher: there were right and wrong answers, and the teacher determined which was which.

When 'facilitating', the underlying assumption was that pupils possessed the necessary knowledge and understanding needed for a particular task, but might need help in recognising or articulating this. Thus 'facilitating' might also entail question and answer sessions, but the structure was looser: there might be a range of appropriate answers, and pupils might be better placed than teachers to determine which approach would work for them. It was also more likely, when teachers were 'facilitating', that pupils would ask questions and engage in a dialogue with the teacher, in which both made suggestions, considered various approaches, confirmed or rejected proffered solutions. An example from the general observation data illustrates some of these aspects of facilitating in the context of a P7 class where groups of pupils had been asked to devise chocolate vending machines as part of science and technology work in which they had been learning about the principles of coils and springs.

Extract 5b: Facilitating in P7

The group has a prototype design and wants to produce the final version

Teacher: Can I just check on what it is you're planning to do?
Pupils run through the rationale for the design.

Teacher: Are people going to be able to reach into the machine? Is that really the front of the machine, or should it be the back?
Pupils think about this and explain their reasoning.

Teacher: I'm having difficulty with this if the machine is lying against the wall. We don't want the chocolate smashed to smithereens.
Pupils consult each other and make some amendments. Teacher moves on.

Extract from field notes, describing six minutes of class time

In differentiating between facilitating and instructing, it is not our intention to imply value judgements. Each of these activities is appropriate in some circumstances, less so in others. For example, instruction may be more appropriate when specific facts, such as the names and roles of the Viking gods, need to be known and learnt. In contrast, it is less appropriate for a teacher to instruct pupils on how to construct a chocolate vending machine when the goal of the task is to see whether they can apply their understanding of the principles of coils and springs.

The difference between 'facilitating' and 'monitoring' lies in the impact of the teacher's activity on the pupils' learning. When 'monitoring', teachers typically moved around the classroom while pupils were engaged on various activities, checking that pupils were on task, that they were not experiencing difficulties and that they were using the appropriate materials. In the course of 'monitoring', they might move into a 'facilitating' role if they discovered that a pupil was having difficulties or could be encouraged to produce a higher quality of work. But 'monitoring' did not necessarily entail 'facilitating'. It often took place in silence or consisted of brief instructions ('Don't go on to page 6 until you've completed all the questions on page 5'), admonishments ('I don't think that's your best handwriting') or words of encouragement ('That's excellent work. Keep it up!').

Observing and eliciting pupil performance

'Observing' and 'eliciting pupil performance' are considered together as they are often linked and probably account for a substantial part of the 'multiple' category in Figure 5.1 above. 'Observing' involved teachers in watching or listening to pupils with the aim of understanding what pupils knew or could do. It was a focused activity, on the part of the teacher, not simply a casual glance around the room. Thus 'observing' was also distinguished from 'monitoring' which, as noted earlier, was intended mainly to ensure that pupils are on task.

Teachers were deemed to 'elicit pupil performance' when they asked pupils to demonstrate their skills in a particular context. The most typical example was asking pupils to read aloud - a daily practice among most of our primary teachers. The pairing of these two approaches was also a feature of expressive arts in which teachers elicited pupil performance by asking them to sing, paint, bounce balls etc., watched as pupils did this and made use of the understanding of pupils' skills they gained through observing to shape what followed in the lesson, or subsequently. 'Eliciting performance' implied an audience sometimes the teacher, sometimes other pupils. Thus it was distinguished from giving instructions to pupils to complete a written exercise where no onlooker would be expected to watch the process in a focused way. 'Eliciting pupil performance' often implied an expectation that pupils would perform well. Thus it tended to be accompanied by praise from the teacher. In this context, pupils were usually asked to do things where there were no clear 'right' or 'wrong' responses and where effort might be more important than outcome. This again distinguished this type of activity from others where teachers expected specific outcomes (eg that pupils answer questions correctly) where the likelihood was that some would do well and others not.

Teachers sometimes observed without 'eliciting performance'. One Primary 1 teacher deliberately incorporated observation periods into her work, usually when the pupils were 'choosing'. Her goal was to assess pupils' manual and social skills, and she was working her way systematically through the pupils in the class, observing them as individuals or in group contexts when the opportunity occurred.

However, the reasons why teachers might elicit pupil performance and then not observe the results are more difficult to explain. Firstly, it was difficult to observe teachers observing. We noted above that observing was defined as a focused activity with a teaching rather than a monitoring purpose. The difference is not always clear. For example, while it may seem evident that when teachers elicit performance, they then observe it, this does not always follow. While asking pupils to read aloud is a regular activity in most classes, teachers did not always focus on the pupil while s/he was reading. They sometimes dealt with queries from other pupils while one was reading, watched the

rest of the class to ensure that the others were working, or wrote up 'reading markers' (slips of card used to indicate to parents the pages which the pupil is to practise reading at home). Such behaviour suggests that teachers may believe that reading skills are developed simply through the habit of reading aloud regularly rather than as a result of close attention paid by teachers to the way in which the pupil is reading. Our experience of observing teachers teaching expressive arts is similar: while pupils are often asked to 'perform' in this context teachers do not always focus exclusively on pupils' performance and what this denotes in terms of progress. They may do this from time to time, but monitoring the activity is more common.

Demonstrate

Our data show that 'demonstrating' is one of the least used teaching approaches overall (6% of teaching time involved demonstrating). Teacher activities which fell into this category involved showing pupils what things looked like, how they worked or how to do things. A visual element was essential to this type of activity, but might simply consist of writing on the blackboard, for example in order to demonstrate the use of punctuation marks.

'Demonstrating' was a feature of expressive arts teaching. In this context, teachers were often called upon to show pupils how to do things: examples from the study included showing pupils how to make brooches out of clay, showing how to make chest passes in netball, demonstrating the correct way to strike various percussion instruments. However, it could occur in any subject, whenever teachers wanted to demonstrate a particular technique to pupils: how to measure angles, how to read features on maps or how to decide which library book to choose by reading the blurb on the back of the book.

■ 5.3 A question of style?

Despite the evidence of some patterns in teachers' choices of approaches discussed in section 5.2, it is important to remember that teachers could employ a number of approaches in a short period of time. Although some approaches might dominate, the teachers we observed maintained flexibility. They did not instruct for long periods of time uninterruptedly, for example, but tended to intersperse instruction sessions with elements from other approaches - demonstrating something, or moving into facilitating mode if, perhaps, the topic under consideration led to a discussion where pupils began to work through the implications of certain issues.

An extract from the field notes taken in one P1 classroom illustrates this point. The teacher is working with a mixed-ability group of pupils, developing their work on the letter 'r' (the 'letter of the week').

Extract 5c: Flexible use of different teaching approaches in P1

The teacher shows the pupils a book about robots and points out the letter 'r' in the title. She shows them the back and the front of the robots in the book.	*Demonstrating*
Pupils ask the teacher to read the book. The teacher reads a robot poem.	*Instructing*
She points out what the robots are doing in various small pictures.	*Instructing [primarily a recapitulation of the poem]*

Say 'r' She shows them a work card with instructions on how to build a robot, and tells them they can do this later during 'choosing' time.	*Eliciting performance [Managing task]*
She asks a pupil to take items beginning with 'r' to the 'r' table.	*Instructing*
IShe shows pupils how to write 'r'. Pupils look at the letter 'r' written on the board and the teacher asks them to practise writing it with their 'magic pencils' [ie their fingers].	*Demonstrating*
L [a pupil] is called out to write 'r' on the board.	*Eliciting performance/ observing*
Is that a good one? Yes. Pupils applaud.	*Eliciting performance/ observing*

Extract from the field notes describing 11 minutes of class time.

This extract shows how the teacher moves easily from one style of teaching to another. Most time is spent on instructing. Reading and commenting on the poem take up about half the time covered by these notes but she ensures that pupils are involved in the activity by drawing their attention to the pictures and by eliciting performance at regular intervals - saying and writing 'r'. What could be a fairly tedious activity (practising a letter which they have been working on for some time) is made more enjoyable by the contextualisation - the robot poem and the other items beginning with 'r', - and the encouragement to perform well. Public performance - writing on the board, reading aloud - was a feature of the classroom and pupils applauded others' performance enthusiastically.

Variation in the use of the different approaches among the teachers we observed was high. Although teachers may have tended to use certain approaches in relation to certain subject areas, and appear to have preferred facilitating to instruction by the time pupils had reached P7, a number of other factors played a part in their choice of approaches. These include the nature of the particular pupils the teacher was working with, the time of day, the time of year, the teacher's own experiences of teaching a particular topic in the past, the teacher's own interests and knowledge of her own strengths and weaknesses. The effects of these factors, some of which are transitory and others which relate to the teacher's accumulated knowledge of what happens in her classroom, contribute to the creation on what might be termed the individual teacher's 'style'.

From the reasons given by individual teachers for adopting particular approaches to teaching, we can see how their decisions are affected by a very wide range of factors which cannot easily be addressed in quantitative analysis. For example, one P1 teacher whose class we visited in November grounded much of her practice on the fact that the pupils were still new to the school, did not yet know each other very well and had experienced a variety of educational experiences before joining the school - some had been in the school's own nursery class, some in other nurseries, and some had not been in nursery at

all. She deliberately used a wide range of approaches in the course of her teaching, including time to observe the pupils at work, in order to find out what was working best for different pupils, where their strengths and weaknesses lay, and how different pupil groupings might support individual children. By the end of the year, her practice might have changed considerably, both because she would she have learnt how best to work with this particular class and perhaps because the freedom she felt to experiment in the first term might have been replaced by a desire to ensure that particular learning goals were achieved by the end of the year.

In contrast, a P4 teacher whom we visited towards the end of the school year had a particularly challenging class. At the time of our visit, she had recently changed her teaching approach, previously based on small group work, because pupils were finding it difficult to concentrate on the tasks she had set while she was working with another group. She had adopted a whole-class teaching approach with a relatively marked emphasis on instruction and eliciting pupil performance in the form of presentations by individual pupils and groups to the class. The reasons for the shift were partly to do with her pupils' preferred approaches to learning: they seemed to gain more from presentational styles of teaching (whether from the teacher herself or from others in the class) than they did from being asked to work on tasks on their own. The teacher's decision to change approach was also a reflection on the difficulties the pupils in this particular class had of seeing themselves as a 'community': there were a number of 'feuds' between individuals and groups in the class, and the teacher felt that a period of working together as a class might help to alleviate some of the tensions.

Thus the emphasis on instruction in this P4 class, and on the use of a range of approaches in the P1 class, while 'typical' of those particular year groups, in terms of the findings from our observation data, arise from very specific circumstances in which the age of the pupils plays a part but is not the only factor. Equally influential are the teacher's preferred approaches to teaching, their experience of working with many different classes and their continual reflection on how the choices they made affected pupils' learning.

5.4 Summary

- Teachers in our study used a range of teaching approaches. Instruction was the most common overall.
- Different approaches predominated for each of the year groups, suggesting that teachers' choices of approach may relate to perceptions of pupils' learning needs as they become older.
- Focused observation of pupils as they worked was relatively rare among teachers.
- A range of factors particular to the individual teacher and the circumstances of the class they were working with also influences teachers' choices. These factors contribute to the creation of teacher's 'style'.

5.5 Implications

Two main issues emerge from our analysis of the data. Firstly, the suggestion that teachers' choice of teaching approach is, to some extent, influenced by the age of the pupils they are teaching warrants further research. Is this to do with the demands of the curriculum or the growing maturity of the pupils, or a combination of these factors? As we noted at the beginning of the chapter, 'facilitating' has been criticised as a 'laissez faire' approach, although our definition of this approach suggests a sophisticated level of

understanding of the ways in which pupils learn, and we found many examples of teachers demonstrating this understanding. Nevertheless, we believe 'facilitating' is particularly demanding teaching approach and that more needs to be known about ways in which teachers can operate effectively as facilitators.

Secondly, while the amount of time teachers were observed to be 'observing' was low, we recognise that this is an aspect of teachers' work which it is particularly difficult for researchers to record for technical reasons. Moreover, the researchers could not record teachers' thoughts while they were teaching or know how much time they spent reflecting on their day's work after the end of the school day. Our interviews with teachers revealed that continual reflection on successes and failures in the classroom is habitual with most teachers.

Nevertheless, we suggest that focused observation of particular pupils, individuals or groups, working in particular contexts is different from reflecting more generally on what has gone well or badly in the course of the day. In our privileged position as observers, particularly when concentrating on a small number of target pupils, we were conscious of occasions when teachers misinterpreted events because they were not aware of what had been happening with an individual or a group of pupils. Clearly teachers cannot know what every child in their class has been doing every moment of the day, but we feel that teachers who have a systematic approach to observing all the pupils in their class over a specified period of time are better placed to understand the complexities of pupils' approaches to learning and of the effects of interactions among groups of pupils. Some teachers may set out with this intention but find that their plans to observe are squeezed out by the many other demands made on their time. Teachers may therefore need to take steps to protect observation time. The teacher who did practise systematic observation commented:

> *Teachers think they can't observe, that it's wasting time. I think you have to say to yourself that it's important. You have to do it in a relaxed atmosphere, rather than scanning the room and panicking because you have to do this, that and the next thing. You sit there, even just for 5 minutes, just to see what they are doing. You can build on what they are doing, but you can only do it through observation.*

6 Emerging Issues

6.1 Review of the report

This report has described findings from observational research into the daily classroom experiences of pupils and teachers in primary schools, in P1, P4 and P7.

Our research had three aims:

- to establish 'baseline' data relating to teachers' and pupils' activities in the classroom. These should indicate how current concerns (for example about the balance of the curriculum or about the relationship of teaching approaches to pupil learning) are met through classroom practice; the data may be also used as a way of measuring changes introduced by new initiatives designed to improve the quality of teaching and learning in the future
- to explore teachers' and pupils' views on their classroom experiences
- to identify classroom phenomena of particular interest which might benefit from more detailed analysis of the data we have, or from additional research.

This report is an account of the main findings to emerge from our initial analysis of the quantitative data we have collected, with some illustrations drawn from qualitative observation and from interviews with teachers. This chapter raises possibilities for further analysis and additional research. We look first at how our findings relate to issues which have emerged from earlier observation studies of primary classrooms; and then from these and other sources, list areas of significance for further research.

6.2 Links to earlier research

In Chapter 1, we reviewed earlier research into classroom practice based on an observational approach, and looked at some of the principal findings. As the design of our own study was based on earlier models, it is possible to make some comparisons between our data and theirs, and to consider links between the findings. In this section, we consider four issues which have emerged from this research and the earlier studies: the balance of the curriculum, connections between pupil-teacher interaction and achievement, demands on the teacher in the course of the school day, and the implications of teaching approaches used in primary classrooms.

The balance of the curriculum

Previous research on the balance of the curriculum in English primary schools, before the introduction of the National Curriculum, showed that the amount of time given to the subjects which, in Scotland make up environmental studies was low. The work of the PACE researchers shows changes in teachers' perceptions of the balance of the curriculum following the introduction of the National Curriculum in England. For example, it appears that more time is now given to science, technology, history and geography.

Although we cannot make comparisons with a time before the introduction of 5-14, our data show that what teachers actually spent their time on in the classroom does not fit 5-

14 recommendations. Concerns voiced by some about a decline in the amount of time given to literacy and numeracy could not be justified, on the basis of our research; nor does our data show expressive arts in decline. However, environmental studies were clearly squeezed in the schools we visited, and the research does therefore raise questions about how teachers maintain curriculum balance over time (bearing in mind that teachers rejected the view that balance should be achieved over the course of one week, with good reason).

It may be the case that teachers' perceptions of the balance of the curriculum do not match what happens in practice. There is evidence that the amount of time teachers spent on particular curriculum areas did not match the amount of time pupils spent on these areas, because the emphasis on small group teaching in many of the classrooms we visited meant that the teacher was frequently working with one group on quite different activities from those on which the rest of the class was engaged. It is also possible that teachers' intentions when they plan the week's work are not always achieved. Further research into possible differences between teachers' perceptions of the time they devote to different aspects of the curriculum and what actually happens may reveal the extent to which teachers believe the current guidelines are appropriate, and if so, how they see this balance being achieved over longer periods of time than one week.

Connections between teacher-pupil interaction and pupil achievement

Previous research (both the ORACLE and the PACE projects) has linked the amount of teacher-pupil interaction to pupil achievement: the greater the level of interaction, the higher the achievement. Our research replicates the PACE finding that target pupils spent just over 40% of their time in interaction with the teacher. (It is not possible to compare our data on this issue with that of ORACLE as methods of data collection differed.) However, our research suggests that it is not only the case that interaction with the teacher equates with high levels of pupil engagement on task. For example, although target pupils were observed to be least on task when working on their own but interacting socially with other pupils, they were most likely to be on task when in collaborative learning situations. In both these situations they were not interacting with their teacher. Moreover when working on their own and interacting with no-one (neither teacher nor other pupils) they were also highly likely to be on task.

In our view, the context in which pupils are asked to work independently of the teacher is an important one. In discussion earlier in this report we have raised questions about the nature of the work pupils are asked to undertake on their own. Some work appears challenging and highly stimulating; other tasks may be repetitive and well within pupils' capabilities, and thus fail to engage them. We have also queried practices in seating arrangements which do not reflect working arrangements and which leave ambiguous the question of whether pupils are supposed to talk to others about their work, allowed to talk to others about their work, or expected to work in silence despite sitting in a social setting.

Demands on the teacher in the course of the school day

The ORACLE researchers have concluded, in comparing their earlier and later studies, that teachers now work harder than before. They found that the amount of teacher-pupil interaction had increased between the first and second studies because many tasks teachers once completed during the school day are now done after school hours. While we are unable to make comparisons with an earlier period, our research suggests that the teachers we observed did most of their assessment and recording work outside the classroom, and that there was a range of other tasks - administrative and pastoral - which required their attention at break or lunch time or after the end of the school day. In the

classroom, our teachers were teaching or managing learning most of the time. Where other activities took up classroom time, this was often because they related to events over which the teacher had little control (such as disruption by pupils requiring the teacher to reassert control) or which were determined by those outside the class (such as interruptions, or administrative tasks required for the running of the school). Our findings would thus appear to be in line with those of recent ORACLE publications (Galton 1998).

The findings can also be linked to conclusions drawn from a recent study undertaken by HM Inspectors of Schools and The Accounts Commission for Scotland (1999) which investigated the amount of time teachers devote to administrative matters. While not distinguishing between administrative work undertaken in class time and that completed outwith the classroom, this report concludes that some teachers experience excessive administrative demands which eat into the time available for teaching and preparing lessons, and that certain tasks would be more appropriately handled by clerical or administrative staff. Our observations support these findings in relation to routine but sometimes very time-consuming administrative tasks which teachers in some schools were expected to deal with during class time.

Influences on teachers' use of different teaching approaches

A tradition in earlier observational studies has been to link changes in teacher approaches to external influences. In the Teaching Strategies in the Primary School project, the assumption was that teacher strategies could be related to 'traditional' and 'progressive' styles of teaching (although this proved not to be the case). PACE and the more recent ORACLE research have explained changes in approach in the context of the introduction of the National Curriculum. These projects were both also dealing with a narrower age range than in our research. PACE findings currently available relate to infants, while ORACLE initially focused on junior school pupils aged between 8 and 10. Our study suggests that the age of the pupils (and, presumably, perceived differences in their maturity as learners) may be influential in determining teachers' use of different teaching approaches.

By extension, we can see that there may be some kind of interlinked relationship between the way in which pupils are perceived by the teacher to learn and the teaching approaches adopted, and that a cause-effect model may be oversimplifying matters. We saw in the previous chapter that one P4 teacher changed her standard way of working because she was aware that some approaches were working much better with this particular group of pupils than others. 'Good practice' entails continual reflection on the effects of the approaches adopted and alterations as necessary to increase the chances of successful learning.

■ 6.3 Further research

Four areas would thus appear to warrant further analysis of the qualitative data we have collected with a view to illuminating issues we have raised so far. These are:

(1) the balance of the curriculum, viewed from teachers' and the pupils' perspectives, and how this is achieved over time

(2) the nature of the work which pupils are expected to do independently of the teacher and the contexts in which they are expected to work independently

(3) the implications of a heavy workload (in and beyond the classroom) for the ways in which teachers organise their classroom work and the impact this has on pupils' learning

(4) teachers' (and pupils') views on changes in the ways pupils learn as they progress through the primary school and the implications this has for teaching approaches adopted.

6.4 In conclusion

This report has focused on features of the work of primary teachers which are susceptible to quantitative analysis of observation data. It was not the brief for this project to discuss the quality of teachers' work or of pupils' learning, particularly in the context of individual classrooms. Although our data raise questions about teachers' classroom practice which we feel deserve further attention, from researchers and from the profession, we do not wish to leave the impression the teachers we observed were failing in some way. On the contrary, we recognise that teaching is a demanding job which requires practitioners to operate at a number of levels simultaneously and to take decisions which are grounded in ongoing reflection on complex classroom experiences. Observers in a classroom have access to only a small proportion of those experiences and these we have tried to describe accurately. We observed a very wide range of teaching approaches and classroom practices in the course of this study. These included some outstanding examples of thoughtful, imaginative and stimulating teaching and we learned much from observing and talking with all the class teachers who participated. We are grateful to all of them for the contribution they made to our thinking.

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PUPIL OBSERVATION SCHEDULE

Pupil Identification:
A **D**
B **E**
C **F**

School:
Date:
Class:
Observer:

Time:

PUPIL ACTIVITY	**A**	**B**	**C**	**D**	**E**	**F**
Engaged on task						
Managing task						
Assessment (explicit)						
Waiting						
Reading						
Writing						
Talking						
Listening						
Drawing						
Using equipment/material						
Using computer						
Interrupted by teacher						
Interrupted by pupil						
Filling in						
Distracted						
Unapproved activity						
Out of roc n						
CHILD INTERACTION						
Alone						
with ct one-to-one						
with ct in group						
with ct in whole class						
with other teacher/adult						
social interaction						
collaborative work						
same sex pair						
opp sex pair						
with same sex group						
with mixed group						
TEACHER ACTIVITY (if directed at target pupil)						
Managing						
Teaching						
Recording/Assessment						
Pastoral						
Control						
Organisation						
Unrelated						
Classroom organisation						

	Main	Part	Main	Part	Main	Part	Main	Part	Main	Part	Main	Part
Curriculum area	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐		☐		☐		☐		☐		☐
		☐		☐		☐		☐		☐		☐

Code:

E	English	**OL**	Other Language	**M**	Maths	**Sc**	Science	**SS**	Social Science	**T**	Technology
HE	Health Educ	**RM**	Religious/Moral	**PS**	Personal/Social	**A**	Art	**Mu**	Music	**PE**	Physical Educ
N	Non-curricular										

Teachers' and Pupils' Days, etc
Operational definitions of timed pupil observation categories and definitions

Pupil Activity	Definition and examples
Engaged on task	Direct involvement with intended task, including watching and listening to the teacher if giving instruction
Task management	Activity associated with the task; collecting materials, sharpening pencils, watching and listening to teacher (if t is managing;) filling in routine record that activity has been completed (not recording as part of the task); cleaning up
Assessment (explicit)	Engaged on a special task given for assessment purposes
Waiting	Waiting for turn, when essential to continuation of task (i.e. not distracted); having no activity (and so not 'filling in' which is activity with no identifiable educational value); register
Reading	Reading for any purpose. The curriculum area and interaction information will identify the context
Writing	Includes recording in a table, writing numbers in mathematics, (Again the curriculum area and interaction define the context)
Talking	Sustained conversation, questions and answer, oral reporting (Context indicated by interaction, curriculum area and teacher activity)
Listening	Where information has to be taken in aurally, as when teacher is admonishing pupils, listening through headphones, listening to other pupils reporting; (not listening to teacher managing, which is 'task management')
Drawing	Drawing for recording, for illustration, for construction, painting
Using equipment/materials	Science equipment, paints, glue, scissors, maths equipment, models, specimens, gym equipment
Using computer	Either alone or in a group, but as approved by teacher
Interrupted by teacher	Definite halt in work as request of teacher, to give attention to something/someone else (not to bring the work to a conclusion)
Interrupted by pupil	Definite halt in work caused by direct interference or disruption nearby
Filling in	Busy-work, either given by teacher or taken up by pupil, which does not appear at the time or later to have purpose other than to occupy
Distracted	Not on task; day-dreaming; talking, messing around without particular aim
Unapproved activity	Engaged on ploy or activity which would not be approved of at any time, or activity proscribed at that time (e.g. using equipment when told not to)
Curriculum area	Put the code for the curriculum area which is the main focus of activity for the three minutes. This will in general be the area identified by the teacher. If the activity explicitly relates to other areas, write these under 'part'.

Child interaction	
Alone	Child's activity is individual even if working alongside others with similar or different tasks; teacher involved elsewhere
With ct one-to-one	Child has teacher's attention as individual not as part of group
With ct in group	Teacher is with group and child gives attention even if not directly addressed
With ct in whole class	Teacher is addressing/ instructing whole class doing the same activity
With other teacher/adult	Child is with adult or teacher other than ct in one-to-one or group
Social interaction	Chatting or non-verbal communication; may be non-task related or task-related (when task is individual and not collaborative); friendly or aggressive
Collaborative work	Joint task of pair or small group which requires positive collaboration towards a joint outcome
Same sex pair	Use when social interaction or collaborative work is indicated if this is with individual child of same sex
Opp sex pair	Use when social interaction or collaborative work is indicated if this is with individual child of opposite sex
Same sex group	Use when social interaction or collaborative work is indicated if this is with same sex group
Mixed group	Use when social interaction or collaborative work is indicated if this is with mixed sex group

Teacher activity	
Managing	Setting things up, giving instructions, keeping things going, monitoring progress, bring task to an end
Teaching	Instructing, telling, demonstrating, facilitating, observing, eliciting pupil performance, transmitting knowledge
Recording	Marking work, recording marks, assessing (formal and informal)
Pastoral	Eliciting pupils' feelings, investigating a problem, offering solutions, suggesting courses of action
Control	Commenting on behaviour,
Organisation	Classroom organisation, administration
Unrelated	Doing work not related to current task, dealing with interruptions

Classroom organisation	Insert code which describes the physical arrangement within which the observed pupil is working: **R** - rows of individual desks; **P** - pupils in pairs at desks; **Ga** -ability groups round tables or grouped desks; **Gm** - mixed ability groups round tables or grouped desks; **GFa** - ability group on floor; **GFm** - mixed ability group on floor; **WF** - whole class on floor; **N** - class not in classroom

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Procedures for Pupil Observers

1. **The general pattern for a day**
T = timed observations G = general observations. The length of G adjusted for each school when the timetable known.

Day	Before break am	After break am	pm first part	pm second part
1	T, G ,T, G	G, T, G, T,	G, T, G, T,	G, T
2	G, T, G, T,	T, G ,T, G	T, G ,T, G	T, G
3	T, G ,T, G	G, T, G, T,	G, T, G, T,	G, T
4	G, T, G, T,	T, G ,T, G	T, G ,T, G	T, G
5	T, G ,T, G	G, T, G, T,	G, T, G, T,	G, T

Although there are a possible 7 sessions each of G and T, the pupils' activities or the events of a particular day may not have allowed for this. In particular, if interviews were held with pupils during class time then one G session may have been lost.

2. **Procedures for T**
Target pupils observed in this order.
A = Average girl
B = Above average girl
C = Below average boy
D = Above average boy
E = Below average girl
F = Average boy

The structured observation schedule used to record 3 x 1 minute observations of each target, allowing one minute between targets. Time intervals written across the top of the schedule when synchronised with the teacher observer.

MAIN activities of the pupil and teacher recorded during each minute.

If the pupil was *Engaged on task,* one other (the main) activity ticked during the minute. Only in the case of reading and writing could two categories be ticked in one minute. This indicated that the task involved pupils reading and responding in writing. These events reported as a reading/writing activity.
If the pupil was either *Managing Task, Distracted, Filling in* or engaged on *Unapproved activity* no other pupil activity box ticked.

For category definitions and instructions re-curriculum area and classroom organisation please see the list of Operational Definitions (attached).

2. **Procedures for G**
In each general observation session the activities and working context of one of the Target pupils were followed. In the next G session next target observed and so on.
Time noted every three minutes. (See Notes on General Observation (attached).

3. **Preparing for discussing an 'event'**

Sometime ***during the morning*** G sessions possible 'events' selected and photographed using digital camera. Up to six photographs taken, showing target child either alone or with others.

During the lunch break one event selected and photographs prepared on computer to show the pupil(s) and teacher in the afternoon.

Sometime in the afternoon , as arranged with the teacher, photograph shown on the computer to the target pupil. If a second pupil was with the target in the picture, both could be involved in the interview (but not more than one).

4. **Interview questions: pupil(s)**
(These relate to PI 3.2 The Quality of Pupils' Learning)

This is a photograph of something you were doing this morning.
Can you tell me about what you were doing?
Were you enjoying it?
Why?
Did you find it difficult?
Why was that?
Did you decide to do this (name activity) or did (teacher's name) tell you do it?
Did (teacher's name) help you?
How?
Were you pleased with what you did?
Was (teacher's name) pleased with what you did?
What do you think you learned?
(If target was alone) Do you often work alone?
(If target was with others) Do you often work with others?
How often do you work alone/with others?
Which do like best -working alone or working with others?
Why?

5. **Interview questions: teacher**
I was interested in what (target child's name) was doing this morning in this picture.
Did (s)he or you choose this activity?
What did you expect him/her to learn from doing this?
Did (s)he find it difficult?
s that what you expected?
What kind of help did you give?
How well did (s)he do it in your view?
Were you pleased with what (s)he did?
(If child worked alone) Does (s)he often work alone?
(If child worked with others) Does (s)he often work with others?
Which do you think is more effective for (child's name)'s learning?
Will there be any follow up from this activity?

TEACHERS' OBSERVATION SCHEDULE

Name of School **Observer**

Class **Date**

Content Ref: .....

Subject Ref E M Sc SS T HE RM PS A Mu PE N

Time:	Activity	Interaction
Manage task	s g k m e	
Teach	i d f o p	0 -1 -2 -3 1 2 3 4 5 6 7
Record	w r ia fa	
Pastoral	fe t s en r c di	
Control	a in or c pu r	
Administration	cl ad	
Unrelated to task	n intun d	
Classroom organisation	WC I AG MG CL	

Content Ref: .....

Subject Ref E M Sc SS T HE RM PS A Mu PE N

Time:	Activity	Interaction
Manage task	s g k m e	
Teach	i d f o p	0 -1 -2 -3 1 2 3 4 5 6 7
Record	w r ia fa	
Pastoral	fe t s en r c di	
Control	a in or c pu r	
Administration	cl ad	
Unrelated to task	n intun d	
Classroom organisation	WC I AG MG CL	

Content Ref: .....

Subject Ref E M Sc SS T HE RM PS A Mu PE N.....

Time:	Activity	Interaction
Manage task	s g k m e	
Teach	i d f o p	0 -1 -2 -3 1 2 3 4 5 6 7
Record	w r ia fa	
Pastoral	fe t s en r c di	
Control	a in or c pu r	
Administration	cl ad	
Unrelated to task	n intun d	
Classroom organisation	WC I AG MG CL	

KEY

M	s	set things up	k	keep things going
	g	give instructions	m	monitor progress
			e	bring task to an end
T	i	instruct, tell pupils things transmit knowledge	0	ignores pupil
			1	accepts feeling
			2	praises or encourages
	d	demonstrate	3	accepts or uses pupils' ideas
	f	facilitate		
	o	observe	4	asks questions
	p	elicit pupil performance	5	lectures
			6	gives directions
			7	response to pupil initiated dialogue
R	w	marking work		
	r	recording marks/ assessment		
	ia	informal assessment		
	fa	formal assessment		
P	fe	investigating pupils' feelings about an event	en	encouraging pupils to resolve own problems
	t	trying to find out why a problem has arisen	r	raising pupil self-esteem
	s	offering solutions to the problem/ suggesting courses of action	c	formal pastoral activity, such as 'circle time'
			di	discussion
C	a	comment on appropriate behaviour	or	issue orders
	in	comment on inappropriate behaviour	c	investigate crime
			pu	punishment
			r	reward
A	cl	classroom organisation		
	ad	administration		
U	n	doing work not related to current task	un	unapproved activity
			d	disengaged from classroom activity
	int	dealing with interruptions		
CO	WC	whole class	MG	mixed group
	I	individual	CL	collaborative group
	AG	ability group		

Teacher Observation Categories and Definitions

M	Managing tasks	**s**	setting up tasks
		g	giving directions
		k	keeping work going
		m	monitoring progress
		e	bringing task to an end
T	Teaching	**I**	instructing, passing on knowledge (in direct or indirect ways)
		d	demonstrating
		f	facilitating (i.e. asking pupils to explain their ideas, extending their thinking, encouraging pupils to review or develop their work)
		o	observing (listening or watching pupils at work)
		p	eliciting pupil performance
Interaction with pupils while teaching		**0**	ignoring pupil
		-1	rejecting pupils feelings
		-2	criticising or discouraging
		-3	rejecting or failing to take up pupil's ideas
		1	accepting pupil's feelings
		2	praising or encouraging
		3	accepting or using pupil's ideas
		4	asking questions
		5	lecturing
		6	giving directions
		7	responding to pupil initiated dialogue
R	Recording and assessing work	**w**	marking work
		r	recording marks or results of assessment
		ia	assessing informally
		fa	assessing formally
P	Dealing with pastoral issues	**fe**	investigating pupils' feelings
		t	trying to find out the causes of a particular problem
		s	offering solutions to a problem
		en	encouraging pupils to resolve own problems
		r	raising pupil self-esteem
		c	engaging in formal pastoral activity (such as 'circle time')
		d	discussing issues
C	Controlling the class	**a**	commenting on appropriate behaviour
		in	commenting on inappropriate behaviour
		or	issuing orders
		c	investigating 'crime'
		pu	punishing
		r	rewarding
A	Dealing with classroom organisation/administration	**cl**	organising the classroom (e.g. collecting books, getting pupils to line up, etc)
		ad	classroom administration (e.g. taking register, checking lunch money)
U	Doing something unrelated to work	**n**	doing other work
		int	dealing with interruptions
		un	doing something 'unapproved'
		d	disengaged
CO	Classroom organisation	**WC**	pupils learning together as a whole class
		I	pupils working as individuals
		AG	pupils working in ability groups
		MG	pupils working in mixed groups
		CL	pupils working together collaboratively

Notes on Teacher Observation

The aim of the observation schedule was to establish how much time teachers spend on various types of classroom activity.

Type of classroom activity
The Schedule was designed to establish how much time teachers spent on each of the broad categories of activity, and on each subcategory (see attached schedule and key for details). In the case of 'teaching', the schedule also allowed researchers to identify patterns of interaction with pupils, loosely following the Flanders interaction scale.

The schedule recognised the fact that teachers were likely to fulfil a range of functions within the space of one minute. For example, while working with a reading group, the teacher could also respond to queries from pupils engaged on other work, monitor the behaviour of the class as a whole, and deal with unexpected interruptions from outside the classroom. Each minute on the schedule could therefore consist of multiple ticks.

The schedule also noted classroom organisation for the whole class each minute. This could be the same for all pupils (i.e. all pupils are working individually) or several could apply simultaneously: for example, the teacher might be working with an ability group while the rest of the class were working either as individuals or in the context of a mixed group.

Notes on recording teacher observation data
The sample sheet shows how, in practice, the observations were recorded. In this Primary 7 class, all pupils were engaged on maths activities which varied according to the particular work set for their ability group. The teacher called each of the three ability groups out in turn, reviewing work already completed and setting up new tasks. While she worked with one group, the other pupils were working as individuals, but at mixed group tables, thus allowing pupils from different ability groups to draw on others' expertise when appropriate (*CO: I/AG/MG*). The observer made additional notes when necessary to explain what is happening or to give examples.

In the first minute, the teacher calls out a new group (*A: cl*). While the members of the group are taking their places on the floor by the teacher, the teacher exhorts the others to continue working (*M: k*). When the group is ready, the teacher comments on what the task for the day will be (*M: s*).

In the second minute, the teacher begins by reviewing the previous day's work. As this is in preparation for the new task, this is still categorised as M: s. She does this by asking a series of questions relating to the work which the group should have completed, such as:

That's how we can tell the difference between a what and a pyramid?

The pupils supply the (correct, in this case) answers (*T: I/4,3*). The intention is both to check on progress generally within the group (*M: m*) and to remind the group of the work they have already done. She also draws various geometrical figures on the board to illustrate the points (*T: d*).

In the third minute, the teacher asks a pupil in the group to read the first question on the worksheet. This still constitutes setting up the task (*M: s*). The teacher asks some factual questions about the content of the question to which the pupil responds correctly (*T: I/4,3*). There is also new content matter which the teacher explains (*T: I/5*). The teacher describes how the task is to be done (*M: g*), and, momentarily distracted from the group in front of her, notes some lapse of concentration among the other pupils working independently. She exhorts them to continue working (*M: k*)

VIDEO RECORDING

In addition to the observation schedule, a video record of one of the five days was made. The aim was to create an additional record against which the researchers' observations could be compared, and to enable additional data to be included at the reporting stage. For example, if a particular sequence of events in the classroom appears from the analysis of other data to be significant or unusual, it might be possible to create a transcript from the video record to exemplify the point. Analysis of video material also enabled the researchers to study a particular phenomenon in greater detail, by repeated viewing of the same event.

The record is made by a fixed camera (i.e. there is no operator) situated in a position in the classroom which allowed the widest possible sweep of the classroom scene. (No one position can capture the whole class, however.) It was possible to change the position of the camera at strategic points in the school day (for example at break or lunch time) if this seemed appropriate, or, exceptionally, for one of the researchers to act as operator in situations where there was considerable movement (for example in drama or PE lessons).

We made clear to schools that the aim of creating the video record was for additional data collection and that material collected in this way remained confidential, as with written records. If, subsequently, we should wish to show any video extracts, this would be renegotiated with the school. Unless specifically requested, we did not show video material to the teacher or to the class.

In practice, the less attention drawn to the camera, the better: teachers and pupils quickly became oblivious of the camera, and we did not find that behaviour changed significantly on the days on which the camera was used.

The picture and sound quality of the recording is high. Although the teacher did not have an independent microphone, it is usually possible to hear what the teacher is saying, and often what pupils are saying. When conversation levels are high, however, this becomes more difficult.

Extended Teacher Interview

Towards the end of the visit one researcher interviewed the teacher for approximately 40 minutes. The aim of this interview was to identify aspects of thinking underlying the teacher's practice.

There were four main areas covered in the interview, with scope for some variation depending on what had been observed. (Questions were not necessarily asked using the precise wording here.)

1 Quality of the teaching process

(a) What approaches are most effective in achieving high standards for pupils?
(b) What opportunities are there for pupils to contribute their own ideas and experiences to the work of the class. How do you create a supportive atmosphere?

2 Meeting pupils' needs

From the children's point of view, what was the most difficult or challenging activity this week? How did they cope? Were there any unexpected outcomes? How did you provide support for pupils with particular difficulties?

3 Quality of pupils' learning

What do you think the most successful activity this week has been? How do you motivate pupils and ensure that they are fully engaged in the work? How do you promote pupil autonomy? When is it appropriate for pupils to work collaboratively and how do you achieve this?

4 Assessment

How is it done? How aware are the pupils on what is required? How are results communicated to parents?

Daily interview with target pupil and teacher, based on classroom photographs

Preparing for discussing an 'event'

Sometime ***during the morning*** G sessions possible 'events' selected and photographed using digital camera. Up to six photographs taken, showing target child either alone or with others.

During the lunch break one event selected and photographs prepared on computer to show the pupil(s) and teacher in the afternoon.

Sometime in the afternoon, as arranged with the teacher, photograph shown on the computer to the target pupil. If a second pupil was with the target in the picture, both could be involved in the interview (but not more than one).

Interview questions: pupil(s) (These relate to P1 3.2 The Quality of Pupils' Learning)

This is a photograph of something you were doing this morning.
Can you tell me about what you were doing?
Were you enjoying it?
Why?
Did you find it difficult?
Why was that?
Did you decide to do this (name activity) or did (teacher's name) tell you to do it?
Did (teacher's name) help you?
How?
Were you pleased with what you did?
Was (teacher's name) pleased with what you did?
What do you think you learned?
(If target was alone) Do you often work alone?
(If target was with others) Do you often work with others?
How often do you work alone/with others?
Which do you like best - working alone or working with others?
Why?

Interview questions: teacher

I was interested in what (target child's name) was doing this morning in this picture.
Did (s)he or you choose this activity?
What did you expect him/her to learn from doing this?
Did (s)he find it difficult?
Is that what you expected?
What kind of help did you give?
How well did (s)he do it in your view?
Were you pleased with what (s)he did?
(If child worked alone) Does (s)he often work alone?
(If child worked with others) Does (s)he often work with others?
Which do you think is more effective for (child's name)'s learning?
Will there be any follow up from this activity?

PROFILE OF SCHOOLS

Including:
(i) Number of Pupils in observed class
(ii) Date of Classroom Observations
(iii) Number of Systematic observations of Target Pupils and Class Teacher
(iv) Teacher sex and length of service and
(v) Total class time per week (approx)

	Composite	Rural	Large rural/ Suburban	Urban
School	**1**	**2**	**3**	**4**
P level	1	1	1	1
(i) Class size	12	26	29	31
(ii) Date	3/98	6/97	11/97	4/97
(iii) No. of observations:				
Target Pupils	465	375	413	324
Teacher	446	402	424	300
(iv) Teacher:				
sex	female	female	female	female
service	long	long	long	short
(v) Class time	21 hours	21 hours	21 hours	21 hours
School	**5**	**6**	**7**	**8**
P level	4	4	4	4
(I) Class size	21	31	31	28
(ii) Date	11/97	4/98	4/97	3/98
(iii) No. of observations:				
Target Pupils	428	455	474	513
Teacher	523	409	512	472
(iv) Teacher:				
sex				
service	female	female	female	female
(v) Class time	long	long	long	long
	25 hours	25 hours	25 hours	25 hours
School	**9**	**10**	**11**	**12**
P level	7	7	7	7
(i) Class size	18	20	24	19
(ii) Date	5/97	10/97	11/97	3/97
(iii) No. of observations:				
Target Pupils	462	401	452	472
Teacher	436	373	537	474
(iv) Teacher:				
sex	female	female	male	female
service	long	long	long	long
(v) Class time	25 hours	25 hours	25 hours	25 hours

ANALYSES OF VARIENCE OF PUPIL DATA

Percentage of time engaged on task

Source	Sum of squares	df	Mean square	F-Ratio	Sig
School	4736.09	10	473.61	4.72	0.00**
Sex	28.94	1	28.94	0.29	0.59
Ability	253.16	2	126.58	1.26	0.29
Error	5217.56	52	100.30		
Total	291755.11	66			

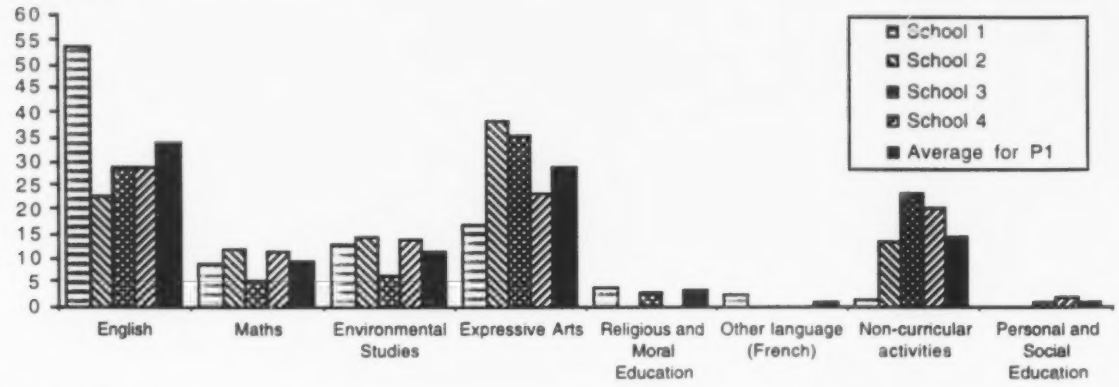
**F=4.72,P<0.01

Source	Sum of squares	df	Mean square	F-Ratio	Sig
School	10186.18	10	1018.62	12.13	0.00**
Sex	179.69	1	179.69	2.14	0.16
Ability	161.70	2	80.85	0.96	0.40
School x Sex	762.78	10	76.28	0.91	0.54
School x Ability	2103.19	20	105.16	1.25	0.31
Sex x Ability	367.71	2	183.85	2.19	0.14
Error	1678.91	20	83.95		
Total	112017.57	66			

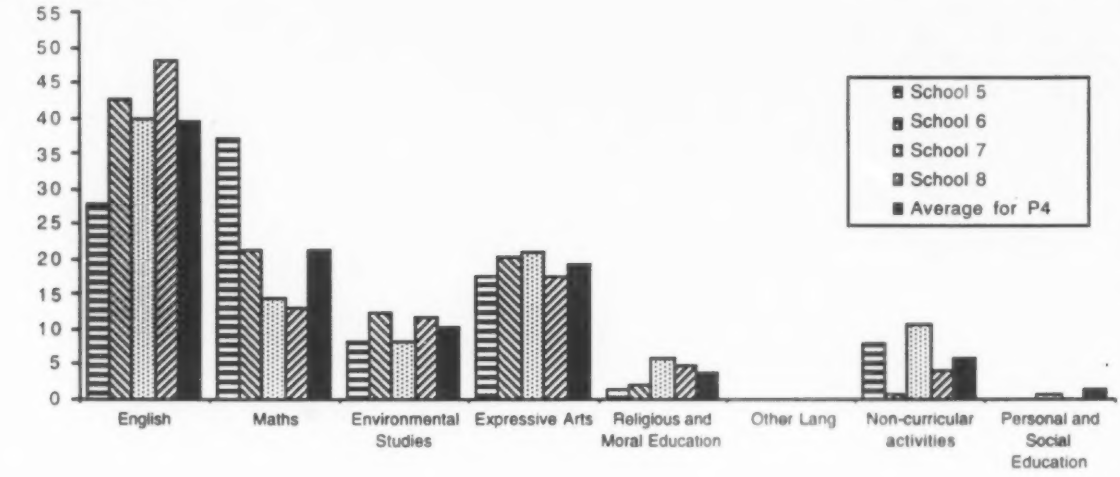
***F=12.13,P<0.001

Figure D.1: Percentage of time spent on various subject areas by target pupils in each school

P1: Schools 1–4



P4: Schools 5–8



P7: School 9–12

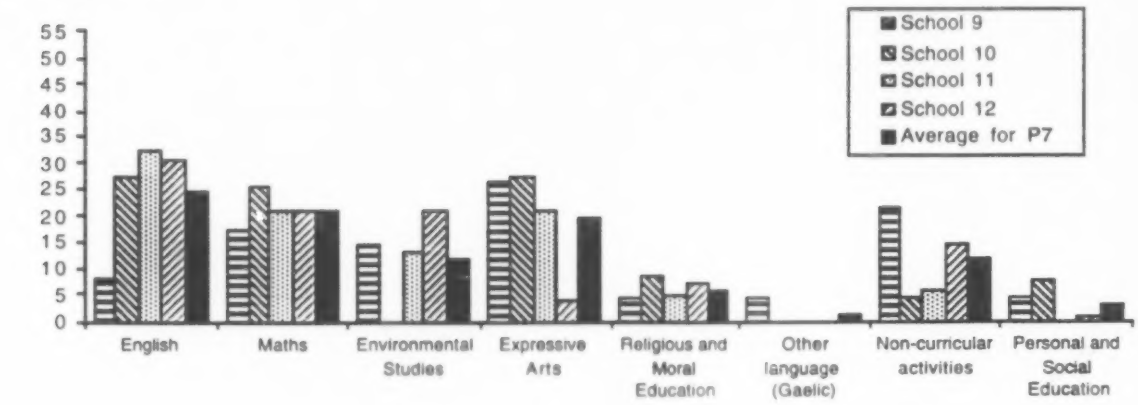
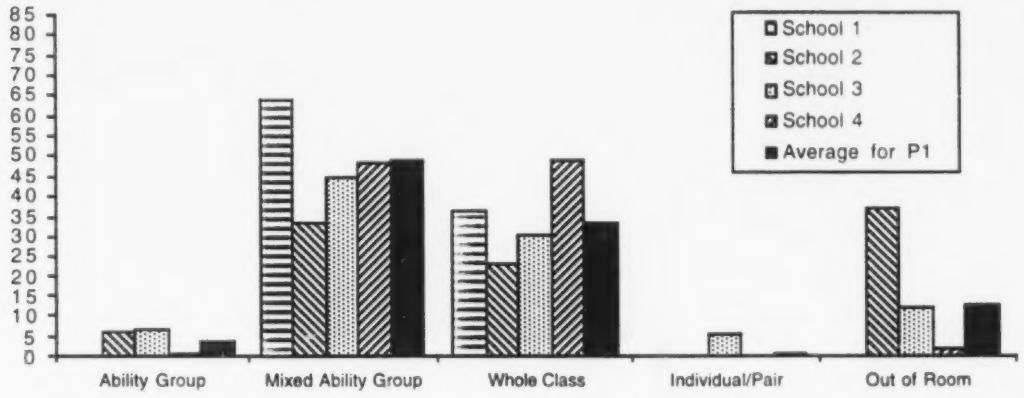
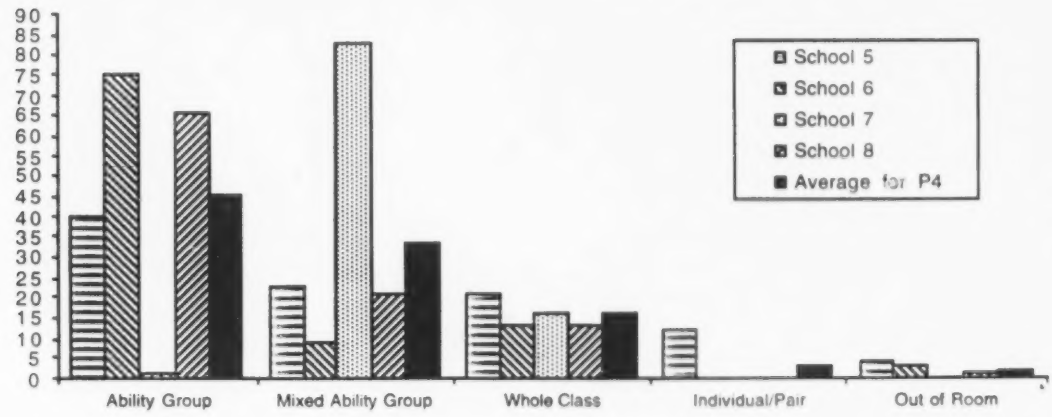


Figure D.2: Percentage of time spent by target pupils in various forms of classroom organisation in each school

P1: Schools 1–4



P4: Schools 5–8



P7: Schools 9–12

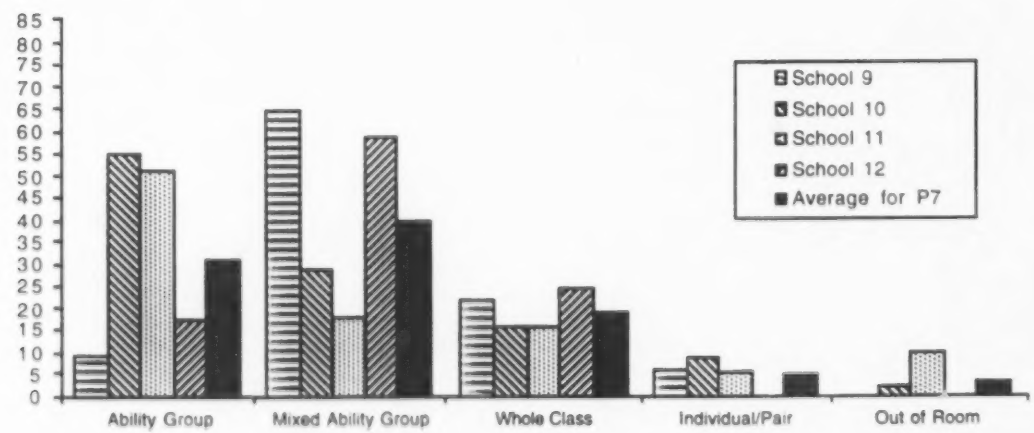
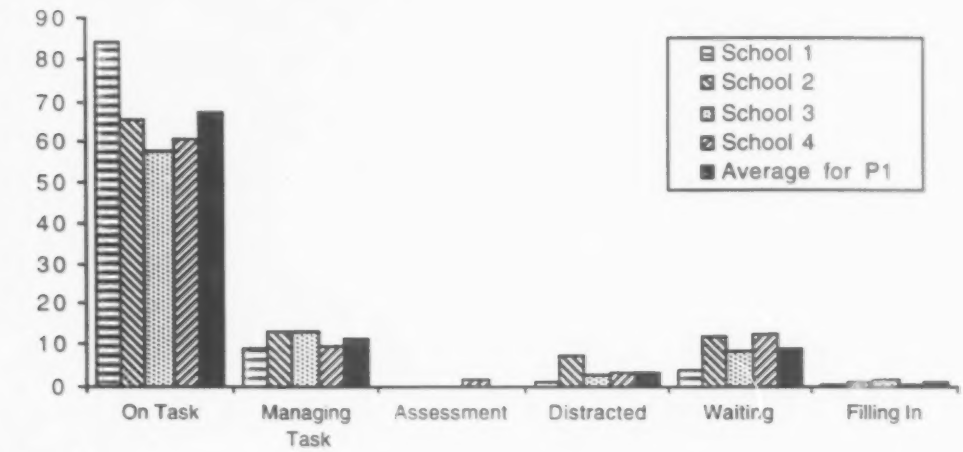


Figure D.3: Percentage of time spent in various kinds of activity by target pupils in each school

P1: Schools 1–4



P4: Schools 5–8

P7: Schools 9–12

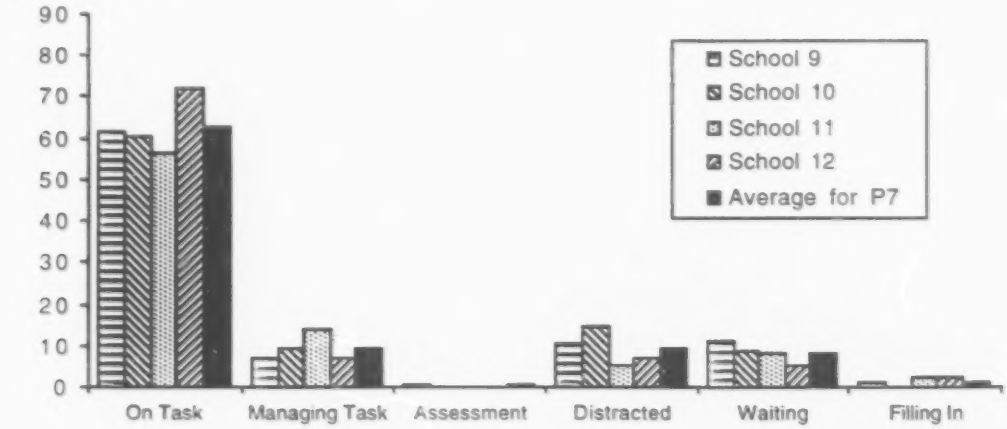
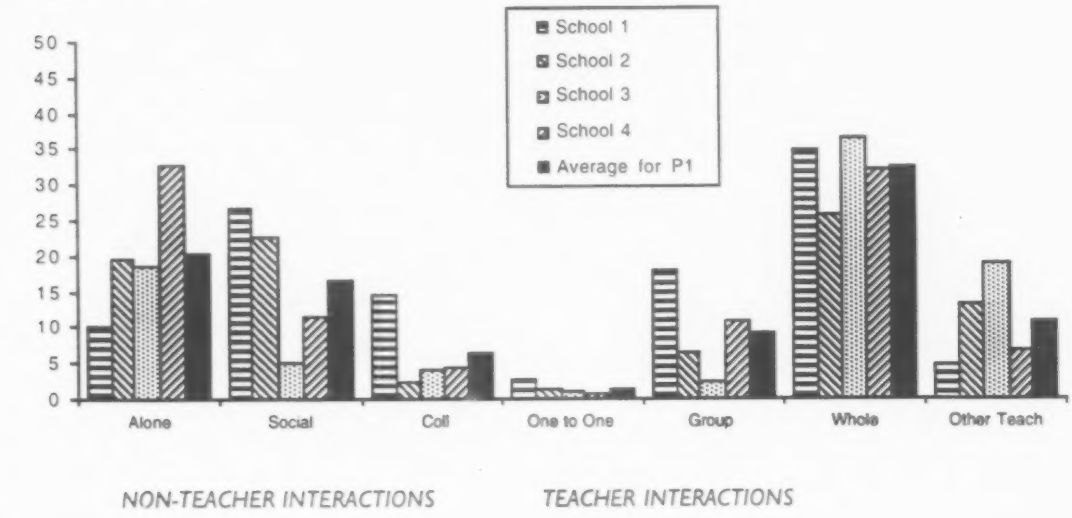
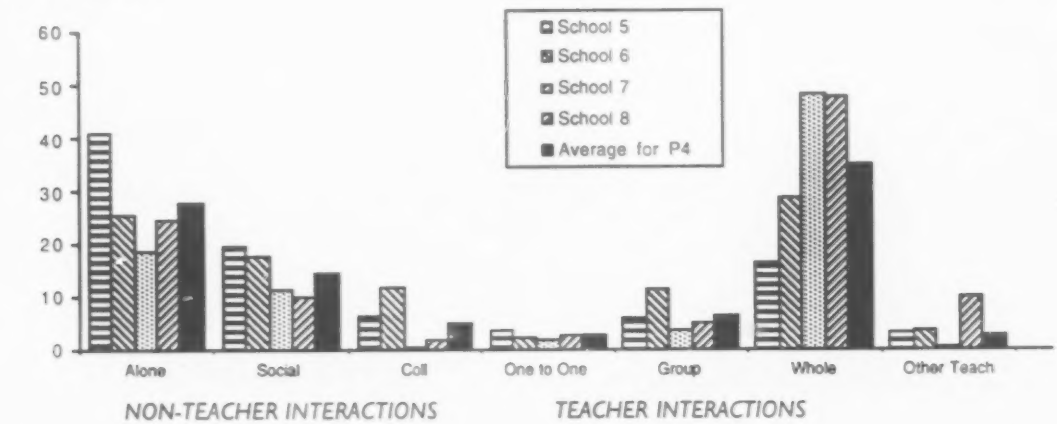


Figure D.4: Percentage of time spent by target pupils in various kinds of interaction in each school

P1: Schools 1–4



P4: Schools 5–8



P7: Schools 9–12

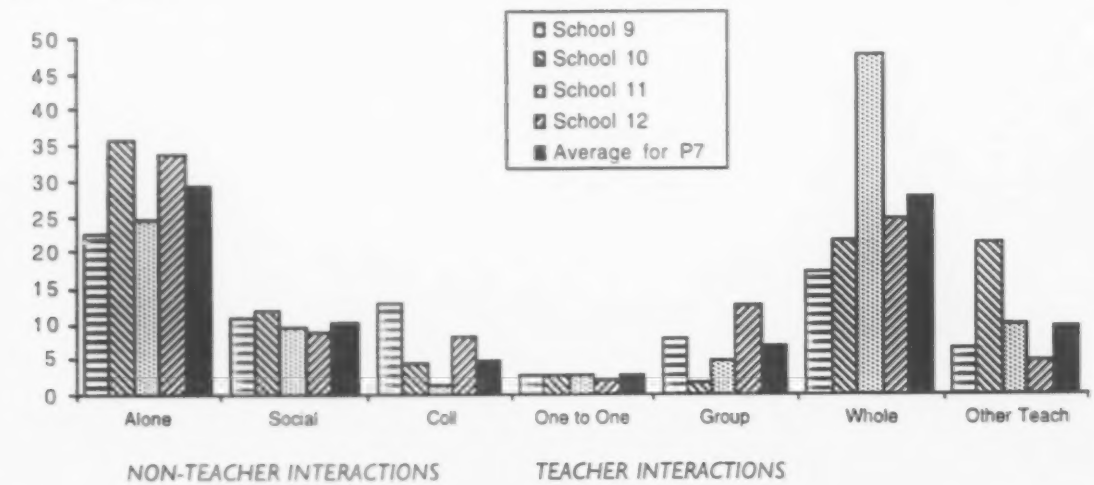
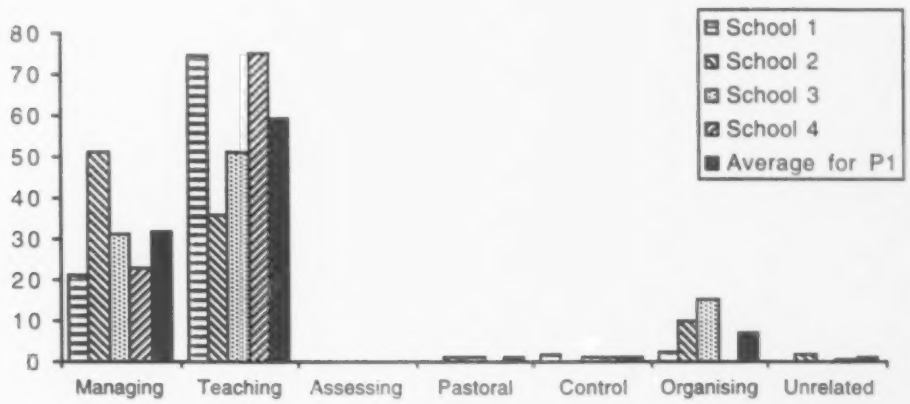
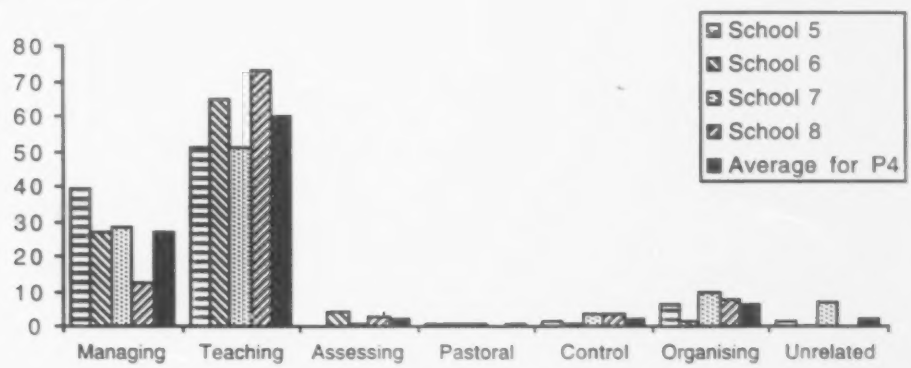


Figure D.5: Percentage of time spent by the teacher in different activities when in interaction with target pupils in P1 classes

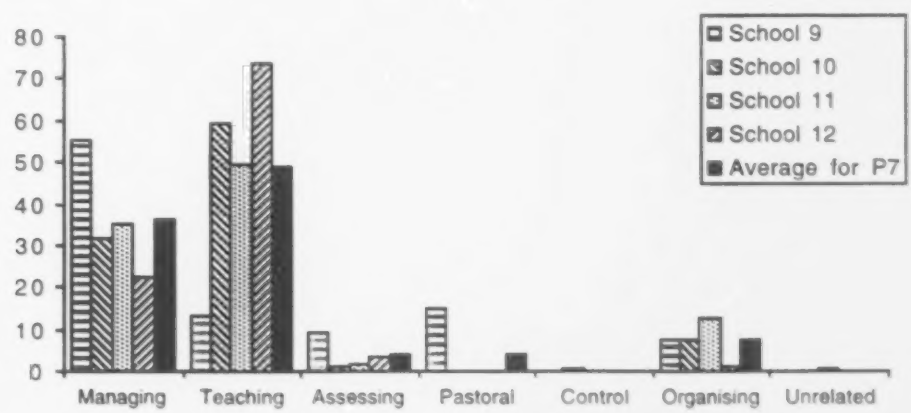
P1: Schools 1–4



P4: Schools 5–8



P7: Schools 9–12



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